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RELATIONSHIP BETWEEN MEASURES OF ACADEMIC MOTIVATION AND ACHIEVEMENT IN COLLEGE. FINAL TECHNICAL REPORT.

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THE VARIABLE, ACADEMIC MOTIVATION (N AC), WAS MEASURED BY A PROJECTIVE TEST. A SCORING MANUAL WITH HIGH INTER-SCORER RELIABILITY WAS ALSO PREPARED. THE 1964 FRESHMAN CLASS OF GEORGETOWN UNIVERSITY (N EQUALS 957) PARTICIPATED IN THE STUDY. ACADEMIC MOTIVATION CORRELATED POSITIVELY AND SIGNIFICANTLY FOR BOTH MALE AND FEMALE STUDENTS WITH GRADE POINT AVERAGE (GPA) AT THE END OF THE FIRST YEAR IN COLLEGE. THE CORRELATIONS WERE HIGHER WITH SECOND SEMESTER GRADES IN CONTRAST TO FIRST SEMESTER GRADES, AND CONSISTENTLY HIGHER FOR FEMALE STUDENTS. FURTHERMORE, N AC SIGNIFICANTLY DISCRIMINATED THE HIGH FROM THE LOW ACHIEVERS, EVEN WITHIN THE SAME LEVELS OF INTELLECTUAL ABILITY. OF ALL THE SUBTESTS THAT COMPRISE N AC, INSTRUMENTAL ACTIVITY CORRELATED MORE SIGNIFICANTLY WITH THE CRITERION (GPA) THAN ANY OTHER, INCLUDING THE TOTAL SCORE. THE PRESENT STUDY HAS ALSO SHED LIGHT ON WHAT MOTIVE REALLY IS, AND HOW IT SHOULD BE MEASURED BY PROJECTIVE TESTS. ACADEMIC MOTIVATION WAS ALSO FOUND TO BE RELATED TO A GREAT NUMBER OF OTHER VARIABLES WHICH CORRELATE IN A SIMILAR MANNER WITH GPA. THEREFORE, N AC MAY BE A SIGNIFICANT VARIABLE IN THE STUDY, AND PREDICTION OF ACADEMIC PERFORMANCE MAY SUMMARIZE SYSTEMATIC VARIATIONS IN OTHER VARIABLES EQUALLY RELATED TO PERFORMANCE. (SK)

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RELATIONSHIP BETWEEN MEASURES OF ACADEMIC MOTIVATION AND ACHIEVEMENT IN COLLEGE

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10. Abstract:

A new variable has been measured, academic motivation or *n* Ac, by means of a projective test especially constructed for this purpose. A scoring manual, with high inter-scorer reliability, was prepared for measuring this motivational variable. The entire class entering Georgetown University in Sept. 1964 (N=957) was given the projective test as well as many other supplemental tests.

Academic motivation correlated positively and significantly, in both male (N-772) and female (N=185) students, with the grade-point average at the end of the first year in college. The correlations were higher, for all students, with the grades of the second as contrasted with the grades of the first semester, and consistently higher, in all instances, for female students. In addition, *n* Ac discriminated significantly the high from the low achievers, even within the same levels of intellectual ability (CEEB scores) and of academic performance (college GPA).

Of all the subcategories that comprise the total score of academic motivation, Instrumental Activity, correlated more significantly with the criterion (GPA) than any other, including the total score. It is very likely that those aspects of academic imagery that contain "activities," "actual use of means toward the goal" by the characters in the story, are more directly related to overt behavior, and that all previous studies dealing with projective measures of human motivation, have not been more successful because the methods employed have measured "concern," or "desire" rather than need or motive. The present investigation has shed light on what a motive really is ("something that prompts to act"),and how it should be measured by means of projective tests. Academic motivation was also found to be related to a great number of other variables (objective, subjective, sociological) which correlate in a similar manner with grades in college. Therefore, *n* Ac may be a significant variable in the study and prediction of academic performance because it, probably, summarizes systematic variations in many other variables equally related to such performance.

TABLE OF CONTENTS

REPORT RESUME Page

Chapter one: THEORETICAL AND EXPERIMENTAL ANTECEDENTS......... 1
- a. Achievement Motivation, 2
- b. N Ach and Academic Performance, 6
- c. Limitations of these Studies, 10

Chapter two: THE NEED FOR ACADEMIC ACHIEVEMENT................ 13
- a. Test for Measuring N Ac, 13
- b. Manual for Scoring N Ac, 16
- c. Basic Hypothesis, 22
- d. Distinctive Characteristics, 25

Chapter three: OTHER VARIABLES: PERSONAL AND ENVIRONMENTAL...... 27
- a. Measurement of Academic Achievement, 27
- b. Personality Variables, 32
- c. Sociological Variables, 35
- d. General Procedure, 37

Chapter four: MAIN RESULTS AND FINDINGS....................... 40
- a. Personality Variables, 40
- b. High Achievers versus Low Achievers, 44
- c. Multiple Correlations, 51
- d. Sociological Variables, 55
- e. Exclusions of Variables, 56
- f. Males versus Females, 59

Chapter five: MAJOR LIMITATIONS............................... 65
- a. The Criterion of Academic Performance, 66
- b. Concern and Motive, 71
- c. Complex Variables, 75

Chapter six: POSITIVE CONTRIBUTIONS........................... 78
- a. Need for Academic Achievement, 78
- b. Motivation and Performance, 83
- c. Theoretical Considerations, 87
- d. Further Advantages, 93

Chapter seven: SUMMARY AND CONCLUSIONS......................... 95
- a. General Findings, 95
- b. Other Contributions, 97
- c. Future Investigations, 100

BIBLIOGRAPHICAL REFERENCES........................ 102

APPENDICES:
- I. Test of Imagination
- II. Scoring Manual
- III. Freshman Survey

CHAPTER ONE

THEORETICAL AND EXPERIMENTAL ANTECEDENTS

The Prediction of Academic Performance

The main purpose of the research to be reported in the following chapters is to study the relationship between measures of academic motivation and performance, or academic achievement, in college students. It has become increasingly evident during the past two decades that measures of academic potential cannot alone predict success in college. A large number of students who are admitted to institutions of higher learning do not achieve their full academic potential as predicted from scores on such measuring instruments as the College Entrance Examination Board and similar intelligence tests. Not infrequently, the drop-out rate is approximately one-third of the freshman class. This rate of attrition persists even at those institutions where the minimum academic potential has been raised significantly over the preceding years. It seems reasonable to conclude that predictors of academic achievement, derived either mainly or exclusively from measures of academic potential, should be complemented with other predictors of a non-intellective nature. It is also probable that academic potential (or related concepts such as Intelligence Quotient scores in varying Intelligence Tests) is not a very meaningful variable. A potential that remains only a potential, that is never actualized or realized, may have little practical and even theoretical value.

There is also an increasing awareness among educational scientists that one of the most important variables for academic success is the motivation of the student for successful achievement in the academic field. It seems obvious that if the potential for academic success is accompanied by a strong need and persistent strivings to attain it, the chances for academic success will be greatly increased and predictions will be much more reliable. However, research carried out thus far, designed to measure this kind of motivation, has not given uniform and significant results. It has been based mainly on subjective and oppinionaire methods such as questionaires or inventories, or on projective instruments not devised to measure directly the construct of academic motivation. An attempt, therefore, to measure, more directly and specifically, the motivation of students toward academic achievement might prove rewarding.

One of the main tools that has been used in our investigations is a projective test similar to McClelland's TAT to measure need for achievement (n Ach). The basic ideas in the present research project originated from work dealing with need for achievement done by the principal investigator during his four years of association with Dr. D. C. McClelland. Therefore, in this introductory chapter it seems very convenient, to offer a review: (1) of the research and general findings on n Ach; (2) of the particular studies dealing with n Ach and academic performance; and (3) of the limitations of this research with regard to our topic.

1. Achievement Motivation

The Need for Achievement

Achievement motivation, or n Ach, may be defined in various ways: competition with a standard of excellence, desire to do things well, concern over accomplishments, tendency to strive for success in challenging situations. We now have a successful method for measuring achievement motivation, developed, as noted above, by McClelland and his associates (1953). Basically the method was obtained by comparing the thought processes of people under the influence of achievement-oriented situations with the thought processes of persons not under this influence. Thought processes were sampled by asking subjects to write imaginative stories about pictures which were similar to those of Murray's Thematic Apperception Test. An objective coding definition has been worked out for detecting those "ideas" with high agreement and scoring reliability among different observers (Atkinson, 1958, pp. 179-204, 685-734). Nearly all of the ideas can be classified under the heading of desiring to do well, need to compete successfully, to excel. The _n_ Ach score of an individual is simply a sum of the number of instances of achievement-oriented "ideas" or images and their subtypes or subcategories (McClelland _et al._, 1953; Atkinson, 1958, pp. 179 ff). The score of the individual is related to some measure of central tendency, -- the average, the median, the mode, -- of the scores of the individuals who make up the group. Thus persons "high" in _n_ Ach will be those subjects whose _n_ Ach scores are above the average for the group.

An extraordinary amount of research has been and is now being carried out dealing with people and societies with high _n_ Ach scores. The basic findings are reported in McClelland's _et al._, _The Achievement Motive_ (1953), McClelland's _The Achieving Society_ (1961), Atkinson's _Motives in Fantasy Action and Society_ (1958), _An Introduction to Motivation_ (1964), _A Theory of Achievement Motivation_ (1966), and Heckhausen's _The Anatomy of Achievement Motivation_ (1967). The readers interested in a full description of the method and a detailed explanation of the evidence accumulated so far are referred to these books and to their extensive references and bibliography.

For the benefit of those of our readers less acquainted with these investigations, a brief summary of the most important findings is presented in the following paragraphs.

Characteristics of "high" achievers

People high in n Ach work harder at laboratory tasks and learn faster (McClelland et al., 1953), have a better memory for incomplete tasks (Ibid., 1953), seem to do their best work when it counts for their record and not when other special incentives are introduced, such as pressure from the outside to do well (Atkinson and Reitman, 1958b), money prices (Atkinson, 1958c),or time off from work (French, 1958). They are more resistant to social pressure (McClelland, et al., 1953), choose experts over friends as work partners (French, 1956), tend to be more active in college or community activities (DeCharms et al., 1955; Kaltenbach and McClelland, 1958), like risky occupations (McClelland, 1956, 1961), perform better under longer odds (Atkinson 1964, Litwin, 1958), tend to choose moderate risks over either very safe or speculative ones (McClelland, 1958; Atkinson, Bastian, Harl and Litwin, 1960b). They show more efficient performances when solving a difficult task or when trying to do it in a new or better way (French, 1955; Klauer, 1959; McClelland, 1961), are confident in their conceived probability of success (Litwin, 1958; Brady, 1966), optimistic (Rosen, 1959b), want concrete knowledge of the results of their decisions (French, 1958), possess decisiveness (McClelland, 1961), and are drawn to and do better at entrepreneurial occupations (McClelland, 1961, 1965b). In the U.S., Italy and Poland, successful business leaders and managers are always higher in n Ach than comparable samples of professionals (McClelland, 1961). Individuals with high achievement motivation are also interested in athletic, competitive games (McClelland, 1961), prefer blue and green colors over red and yellow (Knapp, 1958; McClelland, 1958), show more social mobility (Rosen, 1959b), are less anxious (Atkinson, 1966), and are more concerned about time (Meade, 1966) by tending to anticipate an event before it occurs (Green and Knapp, 1959), by dealing in the stories more often with the remote future (Ricks and Epley, 1959), by thinking more in anticipatory tenses (Zatzkins in McClelland *et al*., 1953), by preferring metaphors of time that suggest motion (Knapp and Garbutt, 1958b), and by wearing 'fast' watches and being, so to speak, 'ahead of themselves' (Cortés in McClelland, 1961).

Societies with a great number of people high in *n* Ach show more rapid economic growth. In ancient Greece a peak in *n* Ach preceded the peak in economic growth (Berlew, 1956); the same was true in Spain from the thirteenth to the eighteenth century (Cortés, 1961), and in England from Tudor times to the industrial revolution (Bradburn and Berlew, 1961). Similar association between *n* Ach and economic growth has been found in Pre-Incan Peru (McClelland, 1961) and in 46 preliterate societies (McClelland, 1961). McClelland also (1961, pp. 70-106) has found a significant correlation of +.53 between *n* Ach scores of children's readers in 39 modern societies and the subsequent industrial growth of these societies.

Finally, the sources or *origins* of this motivation to achieve, seem to lie largely within the family. People high in *n* Ach come less often from broken homes (Veroff *et al*., 1960), are found more frequently in middle-class families (Rosen 1959a), and in those environments where there has been stress on early self-reliance, mastery (Winterbottom, 1958), and achievement (Rosen, 1959b). McClelland describes the optimal conditions for promoting *n* Ach in the members of the family with the following words: the parents should advocate "reasonably high standards of excellence imposed at a time when the son can attain them, a willingness to let him attain them without interference, and real emotional pleasure in his achievements short of overprotection and indulgence" (1961, p. 356). The evidence is far from clear but it seems that n Ach is related to religious affiliation (Veroff et al., 1962) and that it appears to be a masculine characteristic, "even girls project achievement striving primarily into activities of men" (McClelland et al., 1953, p. 173). Oddly enough, people high in n Ach cannot report accurately whether or not they are high in achievement motivation (DeCharms et al., 1955; Atkinson, 1966).

The result of this large collection of research findings, from many and different psychological laboratories, affords a composite portrait of a person high in n Ach as someone who wishes to do well at what he undertakes, who is energetic, dynamic, non-conforming, optimistic, and who tends to be predisposed toward innovations, toward working at tasks that are not safe and traditional but involve some element of risk. In sum, an individual who possesses and demonstrates a great amount of energy both physically and pshychologically.

2. N Ach and Academic Performance

Inconsistent results

From the collection of findings just reported it was reasonable to hypothesize that high achievers would perform better academically, even with the IQ partialled out. This was found to be so on the high school level for males by Ricciutti and Sadacca (1955), by Rosen (1956), although he did not control for intelligence, and by Cox (1962).

However, on the college level the picture is different and far from consistent. Of 12 relevant college studies most of them with adequate control for ability, five found positive relations between achievement motivation and academic performance. McClelland *et al*. (1953) reported that for a sample of male students, the correlation between grades and *n* Ach, as measured by the TAT, was +.39. In another study the TAT measure correlated +.34 with grades (Weiss *et al*., 1959). Burgess (1956) found that overachievers were significantly higher in *n* Ach than underachievers. Bendig (1958) reported a low but significant correlation, +.22, between *n* Ach and the grade-point average for all *preceding* semesters in college. Chahbazi (1956) used two projective measures of achievement motivation and found that when these were added to a battery of six tests, the multiple correlation of the battery with college grades increased from +.51 to +.63. All these studies (except the last one in which the sex composition of the sample is not stated) were conducted using all-male samples.

These results are encouraging but at least seven other college studies have shown that projective measures of *n* Ach are *unrelated* to performance. One of them is reported in McClelland *et al*. (1953, p. 238). Walter (1957) used a special pictorial projective test for measuring achievement motivation and found that the motive was related to only one of five performance criteria. A second study showed achievement motivation to be unrelated to any performance criteria (Haber, 1957). The negative results were attributed in part to the low reliability of the TAT. A third investigation found that test-retest reliabilities of the TAT were rather low, +.25 (Krumboltz and Farquhar, 1957), although a different picture was presented by McClelland *et al*. (1953). Previously, Parrish and Rethlingshafer (1954) had reported that in two groups of males of differing achievement levels the TAT measure of *n* Ach failed to differentiate between them. Mitchell (1961) used a sample of females in a teacher training curriculum and found the TAT to be unrelated to grades. Cole et al. (1962) not only have found the TAT measure unrelated, but that those male students who were superior in academic performance, in fact obtained lower TAT scores than average students. It is because of the great variability of the findings that we have included all these studies under the heading of inconsistent results.

Other findings

For the sake of completeness and because of the relevance that some of these aspects will acquire in later chapters, various other findings related to this topic of academic performance should be mentioned.

Hills (1958) studied first-year law school students and in addition to the six cards for n Ach, he employed three cards for the measurement of achievement motivation in each of the following specific levels: economic, social, academic and professional. He found that these various TAT scores did not correlate with each other nor with criteria of academic success, probably, as he says, because the measures were low in reliability and the sample of law school students was very homogeneous.

McClelland et al. (1953) reported a significant relationship of +.42 between n Ach and scores on the Scholastic Aptitude Test. In research with British children, Robinson (1961) found a similar correlation of +.40 between n Ach and IQ. Morgan (1953) also obtained comparable findings between IQ and n Ach in most of his samples, with +.73 being the highest correlation. In a different study by Littig and Yeracaris (1963) n Ach was significantly related to the academic level. From those low in n Ach, 52 percent had not graduated from high school, and only 14 percent from college. From those high in n Ach the corresponding figures were 36 and 33 percent.

Another type of studies has shown interesting relationships between 'increased' n Ach and grades. Burris (1958) attempted to promote the n Ach level of some college students. He exposed them to an eight week training on achievement motivation. It turned out that these 'experimental' students showed better academic performance in school when compared with a matched control group of students. A similar procedure, but this time with high-school students, is reported by Kolb (1965). During a Summer School course he trained in this type of motivation a group of 20 underachieving boys (IQ above 120 and school grades below C). When compared to a control group of 37 boys who received only the academic program,there were no significant differences in academic performance six months later, but eighteen months later the grade average of the experimental group had improved significantly ($p < .05$), and more so ($p < .005$) in those boys from a high social class. It seems that the effects of n Ach on academic performance may appear more clearly when a fair amount of time (one year or more) has intervened. Some evidence in confirmation of this finding will be presented below when reporting the results of our own investigations.

Very recently Atkinson (1966) has shown that students high in 'resultant' achievement motivation (low scores in Test Anxiety and high scores in n Ach from imaginative stories) manifest greater growth in scholastic achievement and more interest in school work, when placed in a class of homogeneous ability. The opposite is true of those students low in 'resultant' achievement motivation.

Finally, it should be mentioned that, as Byrne (1966) points out: "One of the more intriguing unresolved issues with the n Ach variable is the difference between males and females in achievement motivation." (p. 334). The findings are far from uniform and many studies have failed to elicit this kind of motivation in females (see McClelland *et al.*, 1953 pp. 173 ff.). It is probable that it might be elicited by different conditions (see Littig and Yeracaris, 1965). Byrne (*Ibid.*, p. 335) concludes: "Future research on the achievement motive is most likely to include a much greater interest in the motivation of females and the effects of this motivation on behavior."

3. *Limitations in these studies*

General Remarks

From the results summarized in section 1, it appears that *n* Ach is an important variable in many aspects of personality and behavior. From the results of section 2, it appears only that *n* Ach might be a promising variable with regard to academic performance. The results, however, are so inconsistent that no definite conclusions can be reached. Some reasons can be adduced to explain this lack of uniformity in the results.

1. The main limitation in all the studies relating *n* Ach to academic performance very likely arises from the fact that the TAT instrument is *not* a *direct* measure of *academic* achievement. There is an increasing agreement among human motivation psychologists that *n* Ach is a very general and broad variable that under one label includes many types of achievement. Besides economic, social, academic, and professional achievement (Hills, 1958), there is also artistic, moral, military, creative, etc., achievement. In other words, there are as many types of achievement as there are endeavors and enterprises that men undertake and try to excel in. To include all these varying motivations under a general variable may have been a safe and necessary

procedure at the beginning of these studies, but it is becoming less appropriate as more specific aspects of behavior are being measured and studied. In particular, some investigations (see Atkinson, 1966), have shown that in *n* Ach (and very probably in all the more specific types of *n* Ach included in this variable), at least two basic components or aspects are included: the motive to approach success and the motive to avoid failure. Individuals can be motivated to achieve either because of *fear* of failing or because of *hope* of succeeding.

2. It is also probable that *n* Ach as measured by McClelland's test is especially less adequate for measuring *academic* achievement. Most of the studies published seem to show that what is being measured in this instrument may be called 'economic' achievement, or perhaps better, psychological *energy*, that is, the amount of courage and drive that some individuals possess and apply to their undertakings. Cortés and Gatti (1966) have reported significant correlations between mesomorphy (the energetic constitutional component) and *n* Ach, as measured both by McClelland's projective test and by a subjective questionnaire. Even delinquents seem to possess *n* Ach in a higher degree than nondelinquents, while it is clear that they do not perform better academically than comparable groups (see, among others, Glueck and Glueck, 1950).

3. A similar conclusion can be drawn from many of the findings reported above. As indicated, the general findings seem to characterize the 'high achiever' as a person who possesses a great amount of energy, both psychologically and physically. In confirmation of this assumption we may refer to the findings, already mentioned, that, in various countries, businessmen, entrepreneurs, successful executives, managers, etc., are higher in *n* Ach scores than the professionals, the ones who by definition are prominent in academic endeavors, whether

medical, legal, theological or educational. If anything, n Ach seems to be less related to academic achievement than to other kinds of achievement. Another confirmation of this conclusion seems to be afforded by questionnaire (not projective) measures of achievement motivation. Some of these questionnaires, such as the Edwards Personal Preference Schedule, measure a type of achievement more related to academic achievement, and six investigations, at the college level, have found low but positive relations between achievement motivation (better called v Ach, or value-achievement to distinguish it from the n Ach of the projective instrument) and academic performance (see Lavin , 1965, p. 76). The TAT test, therefore, although a valid instrument for measuring various aspects of human motivation, appears to be much less useful as a measure of academic achievement.

4. The six investigations, just mentioned, using the EPPS, used male samples and, as we noted, one of the unresolved issues in the studies of n Ach was the difference between males and females. One of the reasons for the TAT failure with regard to women may have been that the usual four or six pictures most commonly employed in this instrument depict only male characters. For this reason females could be at a disadvantage when taking the test. There is an obvious need for using pictures with some female characters when testing both sexes.

Other reasons for the limitations concerning n Ach and academic performance will be found in chapters 3 and 6 which deal in more detail with the entire topic of particular measures of motivation and the criteria of academic achievement.

CHAPTER TWO

THE NEED FOR ACADEMIC ACHIEVEMENT

Introduction

This chapter deals with the most specific purposes and with the main instrument of our investigations. The review of findings presented in chapter one has shown the great relevance for psychological studies of the TAT test developed by McClelland and his associates, and at the same time, some of its shortcomings when used for measuring academic achievement or for predicting academic performance. Lavin (1965) after reviewing some of the studies concerning the relationship between *n* Ach and academic performance, suggested that, besides *n* Ach being a multidimensional concept, many other additional variables, or mediating factors, such as high anxiety, may be of greater relevance and importance for some particular individuals. Then he concluded:

> In short, future research on achievement motivation must address itself *first* to the isolation of the specific dimensions of this variable, *second* to the assessment of those dimensions most clearly related to academic performance, and *third* to the specification of other variables which may mediate the relation of achievement motivation to academic performance (*Ibid*., p. 79).

We agree with this conclusion (which contains, in general, the main purposes of the present report) and have nothing to add except that the research should also address itself to the unresolved issue, mentioned at the end of the preceding chapter, of the *differences* between males and females.

Test for Measuring N Ac

For the purpose of measuring one of the specific dimensions of achievement motivation, namely the need for *academic* achievement (*n* Ac, or n Ac Ach), a test very similar to those employed by McClelland has been constructed. We have also prepared a Manual (patterned in accordance to those dealing with need for Achievement, need for Power and need for Affiliation) for scoring the more specific motivational demension which we call'academic achievement.' A brief description of both the Test and the Manual is now in order.

The complete test, preceded by its instructions or directions on how to take it, is included in Appendix I. As can be seen, it contains six pictures, each of them followed by a blank page on which the subject is to write the story he creates for the picture. Five full minutes are given for writing each story and no other instructions are added to those printed in the test. The six pictures are the following:

1. Boy in checkered shirt at a desk with an open book in front of him.
2. Boys and girls seated around a table in a seminar-type setting. A man in the background resembles a professor or instructor.
3. Man seated at a drafting board with some papers and a photograph in front of him.
4. A scene that suggests a college campus: two boys and two girls are talking and have books under their arms.
5. Boy with a vague medical operation scene in the background.
6. A man and a woman working in what appears to be a physics laboratory or a computation center.

Picture number 5 belongs to Murray's Thematic Apperception Test (8 BM). It was used in the original n Ach series and obtained Achievement Imagery in 41.6 percent of the subjects (N=207; see Atkinson, 1958, Appendix III). Number 1 belongs also to the original n Ach series, and the Achievement Imagery elicited was 51.2 percent. Picture 3 has been widely used by McClelland and his associates in numerous studies conducted in various countries. It belongs to a series of six cards, designed to measure n Aff, n Ach, and n Power. The Achievement Imagery elicited was 48 percent in one study (N=50 adult businessmen) and only 16 percent in another (national survey, preliminary findings from a sample of 49 male college students; see Atkinson, 1958, pp. 835-836).

The other three pictures (2, 4, and 6) were especially prepared for this test. All three have male and female characters, and their settings contain some academic cues. They were prepared by taking photographs of some of the students at the University and by asking later that a drawing with less recognizable faces be made from the photograph. By using this procedure the pictures are more similar to the other three and do not look like photographs. Since many studies have proven that situational and pictorial cues do affect the type of motivation to be tested (cf. Haber and Alpert in Atkinson, 1958, pp. 644-663; Atkinson, 1966), the printed instructions to the test are of a 'neutral' type, and the pictures selected appear somewhat vague, offering no excessive academic cues so that they may elicit the motivation to be measured if it already exists in the subject. By convention those pictures which evoke the motive in fifty percent or less, meet this last criterion of not too many cues. We may add, in advance, that all these pictures met the criterion, and that there were no significant differences in the results when we eliminated either pictures 1, and 6, which could contain a higher number of cues, or 3 and 6 in which the characters look older than the students to be tested. Even picture 1 (which in the study quoted had 51.2 percent of n Ach imagery), elicited n Ac in less than 50 percent of the subjects, probably because, as will be explained later, not all instances of n Ach are instances of n Ac.

McClelland's Test is usually given to a group either by projecting the pictures on a screen or by presenting them printed in a small booklet. We selected this second alternative in the belief that the testing is then more uniform and homogeneous. Each student has the same picture in front of him and we avoid either the possibility that they will be looking at the picture from different angles to the screen, or that some because of being seated too far away from the screen, or due to defects in vision, may not see the picture clearly. We tested over 1,000 students separately (the entire freshman class for the academic year 1964-1965), more than 800 boys in a single session (therefore the convenience of printed pictures was even greater) and almost 200 girls, also in a single session, and at the same time but in a different place.

Let us add that the test is easy to do, it takes a total of 30 minutes to complete, and the students, according to their reports, seem to enjoy taking it. Not a single one, from about 200 questioned, could rightly guess its specific purpose. The page in which the story is to be written, following each picture, has some questions spaced in it as possible guides for composing a complete story. While writing each of the stories, after four minutes had elapsed, we announced: "There is one minute left. Do not forget the outcome." At the end of the session 3 extra minutes were allowed so that those who had left some stories incomplete could briefly finish them.

Manual for Scoring n Ac

The Manual is included in Appendix II, and the reader is asked to go over it in order to better understand the brief description that follows. As can be seen, by comparing it with those in Atkinson's book

(1958, pp. 179-233) this Manual follows the same method and very similar criteria. Some comments, however, seem necessary.

A motive is defined as "a disposition to strive for certain kind of satisfaction," or "a capacity for satisfaction in the attainment of a certain class of incentives" (Atkinson, 1964, p. 13). In our case, need for Academic Achievement will be defined as: "a capacity for satisfaction in the attainment of academic accomplishments," or as "desire to do well in school and in the academic professions," and as "competition with a standard of academic excellence." The definition brings to mind that of _n_ Ach (McClelland, _et_ _al_., 1953) but instead of considering achievement in general, it focuses on achievements in the _academic_ field. For this reason, also, the criteria for scoring _n_ Ac will be modified and somewhat restricted. As a rule, however, it may be asserted that _all_ instances of _n_ Ac scored in this instrument will be instances of _n_ Ach, but _not_ vice versa. Some instances of _n_ Ach which do not belong to _n_ Ac may be found in the Manual.

The scoring system is as follows:

Academic _Imagery_ (AI). Any story which does not show clear academic imagery is scored either _Doubtful_ or _Unrelated_ and will receive no further scores in any of the subcategories. It is important, then, to determine clearly whether or not the story contains academic imagery. The criteria and illustrative examples are given in the Manual. Very briefly, concern over academic accomplishments must be either _explicitly stated_ ("this boy wants very much to obtain the highest grade") or clearly _implicit_ in the story as _inferred_ from the character's affective reactions to academic achievements, such as pride, from self-imposed standards of excellence, such as "he is doing his best," or from unique accomplishments and long-term goals of an academic achievement sort, such as "he wants to become a successful doctor."

If the story has academic imagery, the presence of the following subcategories is also scored but only once, no matter how many times they appear:

__Statement__ __of__ __need__ (N). This is scored when a character in the story explicitly states the desire to achieve something in the academic field.

__Instrumental__ __activity__ (I). Any clear indication in the story that something is being done, overtly or covertly, to achieve an academic goal. McClelland scores three different kinds of Instrumental Activity: I+, I-, and I? in order to indicate whether the outcome of such activity is successful, unsuccessful or doubtful. Since the distinction has proven of little practical value, slows down the scoring of this subcategory, and ~~as~~ we have introduced outcome as a special subcategory, these distinctions are __not__ scored in __n__ Ac. We are only concerned with whether or not there is academic-oriented activity. It should be pointed out that this subcategory is very probably one of the most basic. Following M. Arnold's suggestion (1962) a motive might be better defined as "a want that leads to __action__," in our case it is one that leads to academic action, and therefore presence of this type of activity in the characters of the story might reveal "real" motivation rather than, for instance, the __mere__ desire to do well. Some evidence in this direction will be presented later.

As in all subcategories, even if the story has many references to instrumental activity, it is scored only once (a possible limitation in this Manual and those of McClelland). It should also be pointed out that McClelland scores the subcategory, __Nurturant__ __Press__, but this subcategory is not scored in __n__ Ac. It was decided that some instances that could belong to this subcategory, such as seeking or giving advice, asking for help, etc., should, rather, be included under Instrumental Activity.

and that "forces in the story, personal in source, aiding the character," cannot be considered, at least theoretically, as a sign of motivation in the character of the story. These forces are *extrinsic* to him, unless they are sought, asked for, or clearly welcome, and in these last cases they can be considered as revealing some activity on the part of the character.

Affective States (A+ A-). These are scored when the story describes emotional reactions (pride, frustration) associated with academic successes or failures. Both positive and negative affect may occur in the same story, in which case both are scored.

Anticipatory Goal States (G+ G-). When someone in the story anticipates attainment or failure of an academic goal. As with affective states both positive and negative anticipations can be scored. It is important to note that when the character is thinking or planning or wondering *how* to attain the goal, this is considered as covert *activity* (and scored as I); when he is dreaming, thinking or pondering *about* the goal or about its posible results, then this is considered G.

Obstacles or Blocks (Bp, Bw). *Personal* obstacles, such as past failures, are scored Bp (blocks within the person); *external* or environmental obstacles, such as being drafted, are scored Bw (blocks in the world). Both Bp and Bw are scored, if they occur, but as always they are scored only once.

Outcome (O). This category has been added to the Manual for scoring *n* Ac. The instructions place great emphasis on the outcome. A positive outcome may reveal motivation of hope for success and it seemed convenient that special attention be paid to it. Outcome is scored only when it is positive, e.g. "he obtained an A in his exam," but not when it is either doubtful or negative.

Academic Thema (Th). If academic imagery is so strong and so fully elaborated that it becomes the very central or exclusive plot of the story, this subcategory is also scored. Credit is not given when there are clear signs that the characters reveal other kinds of motivation.

Scoring and Reliability

The stories are scored in a way similar to the one suggested by McClelland. In order to avoid fractions or negative numbers, 2 was assigned to AI, 1 to DI and zero to UI. All other subcategories have a value of 1, and the total score for each individual is obtained by algebraically summing the scores of each story and then the scores of the six stories.

One of the advantages of these tests of motivation has been the objectivity in the scoring as shown by the high reliability or agreement found among independent scorers. Atkinson (1958, pp. 685-818) has published abundant practice materials to learn how to score n Ach, n Aff and n Power. After the Manual has been mastered and some sets of stories are scored for practice (and then confronted with 'expert scoring') the percentage agreement among scorers, or the rank-order correlation index, are not infrequently in the .80's or .90's (Ibid., pp. 234-241). The principal investigator in this research had long practice in scoring n Ach under the direction of Dr. McClelland and his associates. His interscorer reliability with experts was +.93 and +.95 on various occasions (see Cortés and Gatti, 1966). Mrs. Florence M. Gatti scored for n Ac practically all the stories (over 6,000) of this investigation. She was first trained to score n Ach (by using Atkinson's book and its set of stories); then to score n Ac by carefully studying the Manual for Scoring Academic Achievement of Appendix II. She and the principal investigator separately scored 150 stories and obtained a coefficient of agreement of +.93. Later over 200 stories were scored, also separately, and the percentage of agreement was +.96. Her scores were the final scores used in this research in over 750 of the students. The other protocols were scored by the investigators. Meetings were held periodically by the three project workers in order to decide, through majority decisions, those cases in which some doubt had remained. The criteria used were always those described in the Manual and were followed very strictly even if subjectively we felt otherwise.

With regard to the method of scoring, it should be added that it takes some time (about 50 hours) to acquire expertness in scoring. First, the Manual should be carefully read and re-read. Then much practice is needed. About 200 stories for both n Ach and n Ac should be scored until the proficiency and percentage of agreement with the expert is high and reaches a coefficient of +.85 or higher. However, once the method has been mastered it takes little more than the time necessary to read the stories in order to score them. The coeficients of agreement given above appear to show that the criteria described in the Manual for n Ac are fairly objective and not difficult to comprehend and assimilate. If anything, very likely scoring this kind of motivation is even easier since it is more restricted or limited than n Ach.

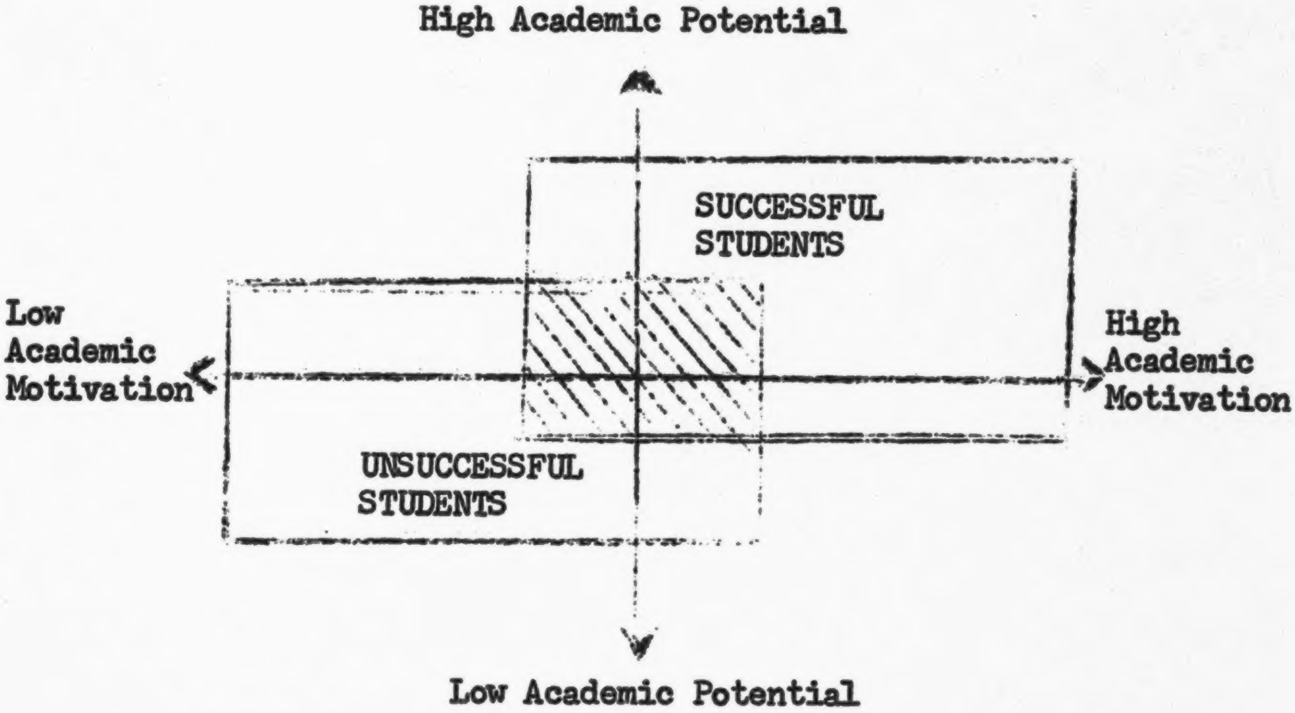
The rationale for scoring the categories and subcategories that have been explained is the following. If academic motivation, as defined, is the "desire to do well in school and in the academic professions" (those which require a degree from institutions of higher learning) or "a want that leads to academic action," it appears reasonable that stories written by students in which the characters are concerned over endeavors and accomplishments of this sort, (when they show instrumental activities toward that goal, overcome obstacles, and express affective reactions and anticipations as a result of the attainment or non-attainment of academic goals) will contain more academic motivation than those stories in which these concerns and activities are not shown. Such stories with high scores in n Ac will then be a sign of high n Ac in the students who wrote them. And if this is true, these students should perform better academically. However, this is the inference or prediction that needs to be either confirmed or disproved experimentally.

Basic Hypothesis

The experimental design and basic hypothesis to be tested in the study may be graphically described in the following Figure (2.1).

Figure 2.1

Relationship between academic potential, academic motivation, and success or performance in college



The design suggests that both variables, academic potential (as measured, for instance, by the CEEB) and academic motivation (as measured by the TAT test) will complement each other and conjointly predict better success in college or higher academic performance. It is expected that the group in the first quadrant, those students high in academic potential and high in academic motivation will be comprised of the best students as determined by such criteria as the grade-point average or perseverance in college. The group in the third quadrant, having a combination of low academic potential and low academic motivation will show opposite results: low grades or high rate of attrition. The groups in the other quadrants will achieve only moderate success, a success that could be differentially predicted on the basis of their amount of academic potential and academic motivation.

The design, however, is an oversimplication of an extremely complex topic. Very many other factors and variables will enter into the problems to be studied. Chapter 3 will deal with some of these other variables and aspects related to this complex topic. Although the results are expected to follow the directions hypothesized, we also expect many other factors to be involved in academic achievement. Such variables will, undoubtedly, obfuscate our findings. It is for this reason that, as the experimental design suggests, a large amount of overlapping is expected. There will be students high in both academic potential and academic motivation who, nevertheless, will be unsuccessful academically, and inversely, some students low in academic potential and motivation will be successful academically. It is not predicted that the study will succeed in isolating all, or almost all, the variables that may affect academic performance. But an effort, to be described in other chapters, will be made to exclude or isolate some of those variables that might greatly influence the results.

Objectives and Specific Hypotheses

The major objective of this investigation has already been mentioned: to find valid and direct measures of academic motivation that may be useful in the prediction of success or lack of success in students at the college level. Subsequent objectives of the study will be to isolate various other factors directly related to academic achievement and to find ways to influence and increase this kind of motivation in those students who are either lacking or very deficient in this variable. This last objective, however, is not a part of the present investigation for it can only be carried out at a later date, after the instrument to measure n Ac has been validated and some other components of this variable have been investigated.

Some of the specific hypotheses to be tested in this project may be briefly stated in the following propositions.

1. There is no significant and positive relationship between academic motivation and academic potential scores. Such lack of relationship between the two variables is in some sense the null hypothesis of this study.

2. N Ac as scored by the TAT test will be positively and significantly related to the grade-point average of the students during the first and second semester in college, as well as with the cumulative grade-point average at the end of the first year in college.

3. Those students who are high in both academic potential (measured by scores in the CEEB) and academic motivation (measured by the TAT test) will achieve more successfully at the college level.

4. When academic potential is held constant, academic motivation will correlate still more positively with academic performance.

5. When academic motivation is held constant, academic potential will correlate positively with academic performance. Of the two measures, however, (academic potential and academic motivation) the latter will have greater predictive power insofar as academic performance is concerned.

6. All these hypotheses will apply to both male and female students.

7. There will be a great amount of overlapping in all these relationships for not only intellective and motivational factors but also many others, such as personality and environmental factors, will have a marked and complex influence with regard to academic performance.

Distinctive Characteristics

Summarizing now, as compared with previous investigations, the present research incorporates, among others, the following distinctive characteristics:

(a) A new projective test has been devised in order to measure more directly than similar projective tests, the variable of academic motivation. This specific motivation is, very likely, one of the dimensions included in the multidimensional construct of achievement motivation.

(b) A Manual has been compiled that provides objective criteria for scoring the more specific construct of academic achievement.

(c) The important psychological problem of whether or not thoughts and imagery (as revealed in the stories) are a predecessor to action or a mere substitute for it, will be carefully investigated. Not only the total scores for n Ac, but also each of the subcategories measured in the test will be studied for their possible relationships to academic performance.

(d) The basic question of whether or not motivational variables are relevant to academic performance and whether or not they are more relevant than academic potential will receive careful consideration.

(e) The entire freshmen population of the academic year 1964-65 (class of 1968) will be tested. Since some of the schools at Georgetown

University are coeducational, and the criteria for admission very similar, both males (about 800) and females (almost 200) will be tested by using the same instruments and thus the possible differences between the sexes in these variables will be more uniformly investigated.

Other aspects of this investigation and many additional characteristics will now be explained in the following chapter.

CHAPTER THREE

OTHER VARIABLES: PERSONAL AND ENVIRONMENTAL

Measurement of Academic Achievement

It was hypothesized in the preceding chapter that when taken conjointly, the two variables, academic potential and academic motivation, will better predict success or academic achievement in college than when either of them are taken separately. However, as indicated there, such hypothesis oversimplifies an extremely complex problem. The main purpose of the present chapter is to point out some of the complexities involved in the prediction of academic performance and to describe briefly many other variables that will also be investigated.

The complexities in predicting academic performance are due to numerous reasons. One of them deals with the criterion for the measurement of academic achievement in college. In the overwhelming majority of this type of studies the criterion for academic achievement has been the student's grades. Grades also, and more concretely the grade-point average, will be the criterion of academic achievement in this investigation, despite the fact that we consider it far from adequate. Despite its many shortcomings, however, it has been adopted in view of the following considerations: (1) the student's grades are the common and traditional criterion, and in order that this investigation could be comparable to so many others in the same field it was necessary or very convenient to employ it; (2) the value of the criterion is very clear from the standpoint of admissions officers of colleges, since to them it is of great practical importance to screen out those candidates who might be unable to successfully complete the program of studies leading to the degree; (3) the ease of obtaining the student's grades, although only a practical consideration, makes this criterion somewhat more appealling and desirable; (4) but, above all, the inability to find or devise a better one, which could be generally or universally accepted, was the main reason for adopting grades as our criterion. Nevertheless some of its many shortcomings should be pointed out.

Student's grades cannot be considered as an ideal criterion of academic performance because they contain numerous sources of variation, and proof is lacking that in a comprehensive and reliable manner they represent success or academic achievement.

Let us look first at some of the sources of variation in grades. Not all students take the same courses. Particularly at the college level students major in many different areas and these majors differ both in course content and degree of difficulty. This is particularly true at Georgetown University, where our testing has taken place. At the undergraduate level the University comprises the College of Arts and Sciences (about 460 male students). the School of Business Administration (practically non-coeducational, about 6 girls out of 110 freshmen), the School of Languages and Linguistics (coeducational, about 55 boys and 80 girls), the School of Foreign Service (coeducational, about 200 boys and 28 girls), and the School of Nursing (about 85 students, girls only). With the exception of the Nursing School, each school offers different majors and beginning in the Freshman year a large number of students, even within each school, do not take the same courses.

Another important source of variation is the fact that teachers have varying methods for conducting examinations as well as differing criteria for assigning grades. Some examinations are objective, others of the essay type, still others a combination of the two. The number of partial examinations and their weight in the final grade varies from teacher to teacher. Likewise, teachers differ greatly concerning term papers and oral participation in class. It is clear then, that there is a very considerable amount of uncontrolled variation in all these factors. In addition, some teachers are 'harder' markers than others and published evidence suggests that subjective criteria operate in teacher's grading practices (cf. Kelly, 1958; Carter, 1953). It is not unlikely that certain characteristics of the student, such as his sex, race, clarity of handwriting, social class background, numerous personality traits and the quality of the relationship between himself and the teacher, to some degree may affect the grade he receives. It is almost impossible to control a great number of these sources of variation.

The amount of variability remains identical or is even greater when academic performance is not measured by individual grades but, rather, by the convenient and generally adopted grade-point average. The grade averages to be used will have been obtained by students concentrating on different majors within the same school and in different schools within the University. Some freshmen major in history or physics; others concentrate on pre-med courses; still others work toward a Bachelor of Arts or a Bachelor of Science degree. The grade-point average at the end of the first year is computed from the grades at the end of the first and second semester, and in both semesters most teachers and courses have been different. Moreover, not all students carry the same number of courses, and not all courses have the same number of credits. Finally, grades depend on many individual characteristics: some students are more anxious than others, some are more independent or introverted or adjusted than others. Their examinations may be affected by these characteristics. Students also vary greatly in the ability to perform well in different areas, in their amount of part-time work or in the number of hours spent in extra-curricular activities. Or they may express themselves better orally than in writing, on essay rather than on objective examinations, in history more than in mathematics or biology. Given all these variables, it may even be questioned whether it is at all meaningful to compare grade-point averages in any group of students. These sources of variation , and many more that have not been mentioned, do influence grades, cannot be, in most instances, fully controlled, and one wonders how it has been possible to predict academic performance as measured by student's grades with even the moderate degree of success already attained.

We can also mention the related aspect of whether or not (even if they were obtained from the same teachers and by objective and uniform methods) grades should be considered as a dependable measure of performance in the academic or professional fields. MacKinnon (1960) has reported evidence from studies on creative research scientists and architects, indicating that these scientists often did not receive outstanding grades in college. Many compiled records of great scientists are actually mediocre. A study by Holland (1960) concerning the correlates of college grades, makes the point that for highly intelligent students, those factors predictive of high performance tend also to be negatively related to creativity. It is probable, then, that high grades alone may not be a very reliable index for identifying those students. who, after college, will make creative contributions.

Personality and Performance

However, irrespective of the inadequacies in the criterion for the measurement of academic achievement, the factors that contribute to such achievement are many and very complex indeed. In the preceding chapter, when academic potential and academic motivation were mentioned, and the basic hypothesis was represented in Figure 2.1, a considerable amount of overlapping was predicted because of the numerous variables and factors that undoubtedly also contribute to success or failure in college. The excellent volume by Lavin, The Prediction of Academic Performance (1965) offers a review of research in this field and it is readily apparent that many types of influences, intellective, personal, sociological, have some bearing on academic performance. Many other variables, therefore, had to be added to the present investigation. They are discussed in the remainder of this chapter with brief indications as to why they were included and how they were grouped, measured, and analyzed.

We conceive personality as "the dynamic and unique pattern of organization within the individual that results from the interaction between the inner forces of his intrinsic nature (motivational, temperamental, intellective) and the outer forces of his particular environment (family, culture, society, religion)." Personality is the interlocking, the structural and architectural totality, or organization, that comes into being from the interplay of individual and environmental variables. Very likely all behavioral aspects, and therefore also academic performance, reflect to some degree all those fundamental variables (individual and environmental) that basically constitute personality.

But, as indicated, personality is something within the individual, it is there in the person; and all personality variables proper (although ultimately deriving from both heredity and environment) are intrinsic to the individual and can be considered as inner or internal factors. It is true that many of these variables proceed from outside influences, but they appear to become part of personality once they have been internalized either by conscious or unconscious processes. The purpose of this clarification is to point out other factors or variables which are more extrinsic to the person such as his social class, his nationality, his parents' educational level, etc. Although more external to his personality, these factors may also have some effect and influence in the individual and, in particular, in his academic performance. We will call this type of variables, outer or external factors, for they appear to be more outside the person, more environmental and sociological, than the inner factors. These two clusters of factors, the internal or individual, and the external or sociological, contain an almost unlimited number of aspects or variables and, obviously, not all could be studied. We had to set some limits to our investigation. Most of the principal variables selected, (a total of 58 to be exact), are indicated in the following paragraphs. In accordance to the preceding conceptualization they are divided into (1) inner or personality variables and (2) outer or sociological variables.

1. Personality variables

Under this heading will be included those variables which fulfill the characteristics explained above, but let us repeat that groups (1) and (2) are not mutually exclusive and that the distinction is used mainly for purposes of clarification and classification. This group of variables may be divided into the following subgroups:

Intellective factors. The CEEB scores of all the students were collected: Verbal (50), Mathematics (51) and Average (52). The numbers in parenthesis after these, and all other variables to be mentioned, represent simply the number used in their coding. These intellective factors are considered in this study as a measure of the academic potential of the students.

Motivational factors. One group are the TAT scores for academic achievement. We have used the total score of the six pictures (32), of pictures 2, 3, 4, 5 (33), of pictures 1, 2, 4, 5 (34) as well as the sum of Instrumental Activity, Blocks and Outcome in the six pictures (35) and in the two groups of four (36, 37). The particular subcategories in each protocol of six pictures were also treated separately: sum of N (38), of I (39), of A+ (40) of A- (41), of G+ (42), of G- (43), of B (44), of O (45), and of Th (46). In addition to these projective measures of motivation, we have added two subjective measures: total home study hours (48) and the total number of hours each student reported that he usually spent studying during an ordinary week (53). These two variables, with identical content but asked from different points of view, were taken from a Questionnaire (included as Appendix III) given to all students. Variable 48 was obtained by combining items 17a and 17c in p. 4 of the Appendix; variable 53 is the score checked by the students for item 17 in p. 9. This Questionnaire or Survey contains items under six headings: general background, educational background, educational and vocational plans, health background, interests and attitudes, and religious background. Many other variables, to be described below, have also been taken from this questionnaire.

Intellective-motivational factors. In this subgroup we include some variables that contain aspects which seem to belong to both preceding headings. They are the total High School grade-point average (26), the grade-point average of the last semester in High School (25) and the converted rank in High School (24). The converted rank was computed by first obtaining the inverted percentile rank and then using the published tables. Rank was used because it has frequently been found to be a better measure of performance in high school. We have employed the converted rank because obviously it does not mean the same to be the first in a class of 18 as to be the first in a class of 368 students. It seems clear that High School grades very probably represent a measure of both intelligence and motivation (as well as of many other variables), and that they include intellective as well as nonintellective factors. Two other variables studied also belong to this group: Ratings by the High School Principal (55) and by a Teacher (56) concerning each student. These data were obtained from the Admissions Office and consisted of a coded evaluation of the ability and motivation of the student (as rated by the Principal and a teacher) during their years in high school.

Psychological factors. The Strong Vocational Interest and the Minnesota Multiphasic Personality Inventory were given to all the students. The Scores in the SVI (13) and in the MMPI (14) may belong to this group, as well as a psychological evaluation of the TAT (15) which was done at the same time the stories were scored for n Ac. We also asked the students if worries prevented them from studying efficiently (16), if they felt less healthy psychologically (17) and how often their poor physical health had affected their work (18; see Appendix III: p. 6 item 5, p. 7 item 13, and page 7 item 15). The average number of hours of their extracurricular activities may also be included in this category (47; see App. III, p. 3 item 12, and p. 4, item 17).

Religious factors. In addition to the religious affiliation of the students, (19), other measures of religiousness were added: frequency of attendance at church (20; item 6, p. 10), attitude toward religion (21, p. 10 item 7), intrinsic religiousness (22; p. 10 item 8) and (mostly for Catholics) frequency in receiving Holy Communion (23, p. 10

item 9).

2. Sociological variables

The variables that we group under this heading, although undoubtedly influencing many personality characteristics of the students, are classified separately because, as explained, they can be considered as being more extrinsic to their personality. Besides age (1) and the School of the University to which they belonged (2), the following were studied: father's and mother's educational level (3 and 4; classified from 1 to 7 according to Warner's scale, 1960 p. 154), father's and mother's occupational level (5 and 6, Warner, pp. 140-141), family background (7, both parents living; one or both deceased; separated; divorced), nationality (8, American or non-American), type of home life (10, unhappy, bearable, pleasant or very happy), type of school attended (9, public, private or both), combined annual income of the parents (11), which parent usually did the disciplining at home (12) and whether the students were boarders or commuters in college (48). The source for all these variables has been section I of Appendix III.

As can be seen numerous and heterogenous variables, from different sources, have been used. Some of them can be considered as objective (for instance, grades in school, rank, scores in the CEEB), others as subjective (most answers to the questionnaire in Appendix III, ratings about the students by other persons), and still others as projective (the TAT scores). As indicated at the beginning of the chapter, the criteria of academic performance have been: first semester college grade-point average (27), second semester college grade-point average (28) first year college grade-point average (29), converted rank in first year college (31), and, for the girls only, second year college grade-point average (57).

Purpose of these variables

The main purpose in introducing variables from so many sources has been to analyze some of the complexities involved in academic performance. All these various groups of factors have been found, in previous investigations, to affect success and grades in college (see Lavin, 1965). The projective motivational variables, specific to this investigation, may also be affected either negatively or positively by all of them. The particular purposes for having included some of the above variables will now be explained by illustrating them with some concrete examples.

Although we are mainly interested in motivation and intelligence, as related to the performance of the student, it appears obvious that some students, even when they possess a higher degree of intelligence and motivation, may obtain poorer grades than inferior students because of too many extracurricular activities or many hours of part-time work, because of family problems and psychological disturbances, perhaps they have selected the wrong major or field of study, or they might be foreigners and therefore handicapped by a weak command of English or the strangeness of a different culture. The supplemental battery of tests, (the MMPI, Strong Vocational Interest Blank, the Questionnaire or Survey), was aimed at controlling to some degree several of these factors. For instance, those students scoring over 70 on any of the Scales of the MMPI, or evaluated as probably neurotic by means of the TAT, will be excluded in a second phase of the investigation since it is probable that they may be suffering from some psychological disturbance and such disturbance may affect either their motivation or their performance. Students with all ratings under B+ in the Interest Blank, (in the pattern of analysis of their major field of study as suggested by the school they attend), may also be excluded as possibly being in the wrong field of study; similar procedures will be adopted with those spending more than a standard deviation above the mean in the number of hours dedicated to extracurricular activities, or to part-time work; with those with unhappy home life, or from another country, and more generally, with those high in variables which correlate negatively either with motivation or performance. By so doing it is expected that the correlations between motivational variables and performance may become clearer for those students remaining after this screening process. But it might also happen otherwise, and the students excluded in this second phase will be contrasted with those included, since all these variables may or may not affect their performance.

General Procedure

The following types of statistical analyses have been performed on all the variables discussed above.

1. Matrices of intercorrelations for the entire sample of freshmen (first all students together, then boys and girls separately, and finally students in each school), have been obtained. It was important to identify which variables, among those selected, had some bearing on both academic motivation and college achievement. A total of 957 students was coded and analyzed. The class for the academic year 1964-1965 comprised over 1,000 students, but some had to be excluded because of incomplete data (particularly the ratings from high school, scores in the CEEB, or grade-point high school average, more common in a number of non-American students) or because, for various reasons, they failed to be present at one or more testing sessions. It is important to indicate, however, that all the tests for n Ac were scored and coded without excluding those with incomplete stories, as it is usually done

when studying n Ach (see e.g., Veroff et al., 1960).

2. Coefficients of multiple correlation between academic motivation (as measured by the TAT), academic potential (CEEB scores) and grade-point average in college have been obtained, not only for the whole sample, but also for boys and girls separately, and for selected samples excluding those students with psychological disturbances, wrong field of study, high number of extracurricular activities, etc.

3. Coefficients of multiple correlation have been obtained between the above variables plus many others such as grade-point average in high school, religiousness, etc., in order to find, from all the variables analyzed, the best predictors of academic performance in college.

4. In order to carry out some of the objectives and hypotheses mentioned in chapter 2, some special investigations have been conducted. Figures 3.1 and 3.2 represent graphically two of the most important.

Figure 3.1
Types of academic performance at different ability levels

OBSERVED ACADEMIC ABILITY (AVERAGE CEEB)	OBSERVED GRADES AT THE END OF FIRST YEAR IN COLLEGE		
	Low GPA	Medium GPA	High GPA
High CEEB	Very Low Achievement 1	Low Achievement 2	Expected Achievement 3
Medium CEEB	Low Achievement 4	Expected Achievement 5	High Achievement 6
Low CEEB	Expected Achievement 7	High Achievement 8	Very High Achievement 9

By following the procedure indicated in Figure 3.1 all students were classified in one of the 9 cells. Then the academic motivation scores of those placed in each cell were computed. If n Ac is a relevant variable the students in cell 9 should be higher in n Ac than those in cell 1; and, probably, those in cells 6 and 8 will be higher in *n* Ac than those in cells 4 and 2, respectively. The means in *n* Ac for other contrasting cells have also been tested for significance. Boys and girls were also analyzed separately. By means of this procedure it is felt that some inadequacies in the concepts of overachievement and underachievement (see Lavin, 1965, pp. 24ff.), have been avoided.

A similar method, illustrated in Figure 3.2, was used for analyzing different motivational levels.

Figure 3.2
Types of academic performance at different motivational levels

OBSERVED ACADEMIC MOTIVATION	OBSERVED GRADES AT THE END OF FIRST YEAR IN COLLEGE		
Total *n* Ac	Low GPA	Medium GPA	High GPA
High *n* Ac	Very Poor Performance 1	Poor Performance 2	Expected Performance 3
Medium *n* Ac	Poor Performance 4	Expected Performance 5	Good Performance 6
Low *n* Ac	Expected Performance 7	Good Performance 8	Very Good Performance 9

Again the means for the average CEEB scores for all the students in each cell were computed, and then tested for significance in contrasting cells, such as 9 versus 1, 6 versus 4, 8 versus 2 and others. Boys, girls, and all students were treated separately. Other statistical analyses which have been performed will be indicated at their proper place in the following chapters.

CHAPTER FOUR

MAIN RESULTS AND FINDINGS

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Overview

To present in detail all the results and findings of this study would take too much space and would become very tiresome for the reader. Tens of thousands of simple correlations among all the variables, and thousands of multiple correlations and tests of significance have been computed. In this chapter only the main results and findings will be discussed. Other aspects of the study, its "principal limitations," and its "positive contributions," will be indicated in the following two chapters where some additional results will be presented. As a whole, we advance that the present investigation has been successful but only to a moderate degree. From another point of view, however, because of the trends uncovered and the new insights that the study has led to and afforded (see chapter 6) we consider the results obtained as very successful and extremely promising.

1. Personality variables

Academic motivation and academic potential

The first hypothesis to be tested, mentioned at the end of chapter 2, has been confirmed but solely for male students. The correlation between the average CEEB scores (a measure of academic potential) and the n Ac scores for the entire freshmen class (N=957) is -.044, indicating that the motivational variable is probably independent, and not significantly related to intelligence or academic potential. The average CEEB scores has been selected because (as discovered by means of numerous analyses and computations) they appear to reflect better the academic potential. However, similar and negative correlations were obtained by using instead the Verbal and Mathematics scores independently (-.017 and -.049 respectively).

But here we begin to find the first difference between the sexes. When boys (N=772) and girls (N=185) were treated separately, the correlation between average CEEB scores and n Ac is more negative (significantly so, $p < .05$) for the boys, -.094, but positive and almost significant ($p < .10$) for the girls, +.137. We are at a loss for an explanation of this difference, but some probable considerations will be offered at the end of the chapter after all the main findings have been summarized.

The amount of academic motivation found in the stories is practically the same for boys (N=772: mean = 11.2; standard deviation = 6.9) as for girls (N=185: mean = 10.7; standard deviation = 7.1). The mean for boys is higher but the difference is small and nonsignificant. In fact, of all the undergraduate Schools in the University, the group of girls from the Foreign Service School has the highest mean, 14.1, in n Ac of all the schools, boys included, probably because the selectivity is high since admission is very limited for them (an average of only 25 girls are accepted from over 400 applications). These girls also have the highest average CEEB scores (667.3) of any School of the University. This similarity in the amount of academic motivation gives reason to conclude that the method for measuring n Ac is not differentially valid for the two sexes, and confirms similar findings, regarding n Ach, with Brazilian (Angelini, 1959), Japanese (Hayashi and Habu, 1962), and German female students (Heckhausen, 1963). In a recent book the last mentioned author concludes:

> Compared with women undergraduates in the United States, those in Brazil, Japan and Germany constitute a *selected* minority whose achievement-oriented self-concept is closer to that of the male sex (Cf. Heckhausen, 1967, p. 18).

It is probable that we have confirmed those findings because not only in the Foreign Service School, but also in the Schools of Nursing (N=85) and of Languages (N=70) the *selectivity* is very high. In the Language School the girls have a slightly higher CEEB score than the boys. At any rate, in the *amount* of *n* Ac scored we have not found significant differences between males and females.

Motivation and Academic Performance

The criteria for measuring academic performance have been the various grade-point averages: (1) at the end of the first semester, (2) at the end of the second semester, and (3) the combined average for the first year in college. Table 4.1 presents the correlations between these criteria, total *n* Ac in the six pictures, and some of the subcategories which comprise academic motivation.

Table 4.1
Relationship between academic motivation (*n* Ac), some of its subcategories, and academic performance (GPA).

	All Students N= 957			Boys only N = 772			Girls only N = 185		
GPA =	1 sem.	2 sem.	1 year	1 s.	2 s.	1 y.	1 s.	2 s.	1 y.
Total *n* Ac.	.082*	.109**	.103**	.062	.070	.072*	.182*	.249**	.231**
Total IBO	.085**	.120**	.111**	.069	.085*	.084*	.198**	.252**	.239**
Total I	.091**	.127**	.117**	.075*	.092**	.090*	.217**	.258**	.250**

* ** significant beyond the .05 and .01 levels respectively.

As can be seen, all these correlations are low but positive. Despite their low values, since N is large, most of the correlations are significant, a good number beyond the .01 level of confidence.

The results, then, do confirm the basic hypothesis of this investigation, even though the degree of confirmation is moderate. However, there are various and suggestive definite trends in Table 4.1. (a) All correlations are higher for the second semester GPA (and consequently for the first year GPA) than for the first semester. This is also true (though not shown in the Table), for all the undergraduate schools (College, Foreign Service, Languages, Business, Nursing), as well as separately for boys and girls, either all together or within each of the schools. The difference between the two sexes is in the degree of significance, not in the direction of the trend. (b) Of all the subcategories we have scored, Instrumental Activity (I) is by far the best, even better than the total n Ac, again in all groups by schools, and in both sexes. The combination of Instrumental Activity + Obstacles (or Blocks) + Positive Outcome (IBO) also correlates better in all groups than total n Ac. This may be an important finding and will receive proper attention in chapter 6. The other subcategories not included in the Table either follow the same trend (A+, B, O, Th) or are negative or insignificant (N, A-, G+, G-). This is also suggestive, and in that chapter the data will be discussed and presented in more detail. (c) All in all, n Ac appears to be more positively correlated, and to better predict academic performance, for girls than for boys. A greater number of correlations reach the .01 level of significance for female students. We find here a second difference between the sexes that will be discussed later in the chapter. The same trend will appear when presenting, for boys and girls, the correlations between GPA and CEEB scores, and the correlations between GPA in high school and in college. (d) Although the GPA for the second year in college was not to be included in the present study (but in a second phase or stage), we have already computed the correlations, for all girls only, between the second year of GPA in college and n Ac. These new correlations are similar to those for the first year GPA. There is reason to believe, however, that, (as in similar investigations with n Ach mentioned in chapter 1) n Ac may be a better predictor of performance when a longer span of time has elapsed between the measurement of n Ac and the criterion of academic performance, but this question needs further research. We have neither confirmed nor disproved it. In the first two semester of college, let us repeat, this has been found to be true.

It may be interesting to note in passing that, for the boys, (as the negative correlations would suggest) the higher the average CEEB scores the lower is their mean n Ac. Those students over 700 in CEEB (N= 57) have a mean of 10.42 in n Ac, lower, but not significantly so, than the mean for all the students and for all boys and all girls. By classifying the boys into "high" CEEB scores (mean: 630.1), "medium" (600.1) and "low" (570.6), the means for n Ac are respectively: 10.94, 11.45 and 11.44. The trend is not similar with the girls (means: 10.84, 9.28, 9.66). But, as these data suggest, the correlations between academic potential and academic motivation are very probably non linear, and the upper third of the male students (high CEEB scores) are not the most motivated. Heckhausen may be correct when he writes:

> More precisely: from a certain high degree of native ability on up, improvements in intelligent performances is promoted more by increases in the strength of motivation than by increases in the level of native capacity which is already high... (1967, p. 129).

High Achievers versus Low Achievers

In Figure 3.1 of the preceding chapter we proposed an experimental design for analyzing the relationships between observed intellectual ability (CEEB scores) and observed academic performance (college grades). By doing so we hoped to avoid some confusion in the concepts of over- and underachievement. As can be seen in Figure 3.1 or Table 4.2, for those students of high intellectual ability (cells 1-3) overachievement cannot occur. The academic performance category of a student in the highest ability grouping can only be equal or less than the ability classification; vice versa, the performance of a student in the lowest ability (cells 7-9) group can only be equal or greater than the ability classification, and therefore he cannot be an underachiever.

In Table 4.2 all students about whom we had complete data in all variables (N= 862), have been classified according to the criteria of Figure 3.1. Three groups of students with approximately the same number of subjects were made: those with high, medium and low GPA at the end of the first year of college. Then each of these groups was further classified into high, medium and low CEEB scores. The 9 resultant cells control for ability and performance. Then the mean n Ac for all students in each cell was obtained and has been included in parenthesis in the center of the cells. The lower part of each cell has the corresponding N and the number (from 1 to 9) assigned to each cell. The figures in the upper part indicate the means of the CEEB scores and of the GPA for each group of students respectively.

See Table 4.2 on the following page

Table 4.2

Academic motivation at various levels of ability and performance

OBSERVED ACADEMIC ABILITY (Av.CEEB)	OBSERVED PERFORMANCE AT THE END OF FIRST YEAR IN COLLEGE		
	Low GPA	Medium GPA	High GPA
High CEEB	649.7 1.84 Very Low Achievement (*n* Ac = 8.21) N=71 (1)	658.9 2.59 Low Achievement (*n* Ac = 11.31) N=104 (2)	668.7 3.29 Expected Achievement (*n* Ac = 12.30) N=159 (3)
Medium CEEB	595.3 1.78 Low Achievement (*n* Ac = 10.03) N=79 (4)	594.8 2.54 Expected Achievement (*n* Ac = 12.10) N=76 (5)	595.9 3.19 High Achievement (*n* Ac = 10.32) N=80 (6)
Low CEEB	525.5 1.74 Expected Achievement (*n* Ac = 10.05) N=122 (7)	534.3 2.50 High Achievement (*n* Ac = 13.07) N=104 (8)	540.8 3.18 Very High Achievement (*n* Ac = 12.47) N=67 (9)

High and Low *achievers* are defined operationally as those students (in the undergraduate schools of this University) who were at opposite ends in the two levels (performance and ability): for instance, first third in GPA and last third in CEEB, or last third in GPA and first third in CEEB. Cells 1 and 9 are the clearest examples: very low achievers versus very high achievers. It can be seen that the difference in average motivation is very high: 8.21 versus 12.47. The t test gives the statistic 3.48, significant beyond the $<.001$ level (df=136). Motivation is a relevant variable in academic performance. Cell 1, the lowest in achievement is also the lowest in motivation. Except for cell 6 (lower in *n* Ac than cell 2) the trends are always in the expected direction. The low achievers (cells 1, 2, 4) have an average *n* Ac of 9.85; the high achievers (cells 6, 8, 9) an average of 11.95; with the moderate achievers (cells 3, 5, 7) in between: 11.48. The first row of cells shows the relationship very clearly; very low achievers, low achievers and moderate (or expected) achievers rise from 8.21 to 11.31 to 12.30 in motivation. However, the group lowest in CEEB and GPA (cell 7) and the group highest in CEEB and GPA (cell 3) do not have the lowest or highest mean n Ac, showing again that the relationships between the variables are not high or strictly linear. In the cells of the medium GPA category (2, 5, 8) as the CEEB scores decrease, the mean n Ac increases: 11.31 for the low achievers, 12.10 for the moderate achievers (expected achievement), and 13.07 for the high achievers. Motivation is again clearly related to academic performance: within the same category of academic performance, the lowest the academic potential the highest the academic motivation.

Males and Females Separately

In Table 4.3 we have performed the same classification as in Table 4.2 but for males and females separately. The number in parenthesis on the left-hand margin of the cells represents the mean n Ac for all the boys in that cell; the one on the right-hand, the mean n Ac for all the girls in that cell. For the sake of clarity the means of the CEEB scores and of the GPA in college have been excluded; they are similar to those in Table 4.2.

See Table 4.3 on the following page

Table 4.3

Academic motivation at various levels of ability and performance for boys and girls separately

OBSERVED ACADEMIC POTENTIAL (Av.CEEB)	OBSERVED PERFORMANCE AT THE END OF FIRST YEAR IN COLLEGE		
	Low GPA	Medium GPA	High GPA
High CEEB	(8.37) (6.50) Very Low Achievement (1)	(11.18) (11.81) Low Achievement (2)	(11.80) (14.20) Moderate or Expected Achiev. (3)
Medium CEEB	(10.23) (8.60) Low Achievement (4)	(13.25) (7.50) Moderate or Expected Achiev. (5)	(9.96) (11.75) High Achievement (6)
Low CEEB	(10.50) (8.67) Moderate or Expected Achiev. (7)	(13.81) (10.62) High Achievement (8)	(13.51) (9.69) Very High Achievement (9)

The trends are identical for boys and girls. Cell 1, very low achievers, has the lowest mean n Ac of all 9 cells for both sexes (difference between cells 1 and 9 significant beyond the .001 level). The low achievers (cells, 1, 2, 4) have an average n Ac of 9.92 (boys) and 8.97 (girls). The moderate achievers (cells 3, 5, 7) an average n Ac of 11.51 (boys) and 10.12 (girls). The high achievers (cells 6, 8, 9) an average n Ac of 12.42 (boys) and 10.68 (girls). The difference between the means for the groups of high and low achievers are significant in both sexes beyond the .01 level. The trends in motivation in cells 1, 2, 3, and in cells 1, 4, 7, are clear. As achievement increases motivation also increases. But the relationships are not perfect for all cells. It is only when the extremes are contrasted: very high achievers versus very low achievers, or the three cells of high achievers (9, 8, 6) versus the three cells of low achievers (4, 2, 1) that the means differ significantly.

We also classified all students according to the schema of Figure 3.2: first into high, medium and low GPA, and then into high, medium, and low n Ac. The means for those with high GPA were 11.13 in n Ac and 627 in CEEB scores, for those with medium GPA 10.99 in n Ac and 598 in CEEB scores, for those with low GPA 10.14 in n Ac and 585 in CEEB scores. All are in the expected direction. The students with high n Ac (mean = 18.78) had a mean of 598 in CEEB scores; those with medium n Ac (mean = 9.96) had a mean of 600 in CEEB scores; and those with low n Ac (mean = 2.54) had a mean of 606 in CEEB scores. These last results confirm the negative correlation between n Ac and CEEB scores found for all students.

The best predictors

Academic motivation, as we have measured it, has been shown to be positively related to academic performance. However, there are two other groups of variables that consistently have appeared as being more positively related to performance and that, undoubtedly, are more relevant and possess a much greater predictive value. These are the CEEB scores and the high school GPA (or QPI). Table 4.4 gives the correlations between GPA at the end of first year of College and six variables. Three of these variables refer to GPA in high school or past academic performance: the converted rank in High School (24), the GPA in the last semester (25) and the total High School GPA (26). The other three refer to academic potential: the Verbal (50), Math (51) and average (52) CEEB scores. We have added, in parenthesis, the correlations between n Ac and all six variables.

Table 4.4

Correlations between CEEB scores, performance in high school and performance in college

Variables =	50	51	52	24	25	26
All students N = 957	.324 (-.017)	.312 (-.049)	.374 (-.044)	.533 (.079)	.544 (.075)	.541 (.090)
Boys N = 772	.296 (-.057)	.318 (-.075)	.360 (-.094)	.518 (.082)	.528 (.073)	.525 (.097)
Girls N = 185	.423 (.157)	.381 (.090)	.467 (.137)	.613 (.107)	.644 (.129)	.628 (.095)

A few important conclusions can be inferred from Table 4.4. (1) The relationships between the CEEB scores (50,51,52) and the first year college GPA are positive and significant, as well as consistently higher for girls than for boys. (2) The relationships between academic performance in high school (24, 25, 26) and first year GPA in college are very substantial, and again higher for girls than for boys. This study, in confirmation of many others, shows once more that past performance (in high school) is the best predictor of future performance (in college). Of all the variables studied in their relationship to performance in college, these (24,25, and 26) are by far the best and most significant. (3) As expected, n Ac as measured from the TAT, correlates positively with the GPA in high school (parenthesis in Table 4.4). This is true in boys and girls but, as in previous instances, the correlations are somewhat higher for the girls than for the boys. (4) The correlations between CEEB scores and n Ac (parenthesis in Table 4.4 in variables 50,51,52)are positive for girls and negative for boys. We have noted this above and it appears that academic potential and academic motivation are more intimately related in girls than in boys; as if academic motivation were, so to speak, automatically present in those girls who have a fairly high degree of native ability and are attending college. (5) The correlations (not included in Table 4.4) between average CEEB scores (variable 52) and academic performance in high school (variables 24, 25 and 26) are high, namely; +.302, +.284, +.311 for all students; +.293, +.290, +.322 for all boys; and +.478, +.385 and +.372 for all girls. Therefore, (a) the best single predictor of future performance in college, as indicated, is performance in high school; (b) GPA in high school can be considered, as we did in the prededing chapter, as a variable that comprises intellective as well as motivational factors (it correlates positively with both CEEB and n Ac). It is highly probable that for this reason such multidimensional variables as the GPA in high school are better predictors of future academic performance than variables more exclusively either intellective (CEEB) or motivational (n Ac) when these are employed separately.

Multiple Correlations

Thus far we have shown the relationships between a single variable: n Ac, CEEB scores, GPA in high school, and GPA in college. In chapter two the hypothesis was advanced that students high in both academic potential and academic motivation would more successfully achieve at the college level. The findings presented in Tables 4.2, 4.3 and 4.4 have confirmed this hypothesis, at least indirectly. We have also shown that both variables: CEEB scores (Table 4.4) and n Ac (Table 4.1) correlate positively with grades in college, and that these two variables are not positively interrelated in male students.

The single correlations for all students, and for males and females, between average CEEB scores and GPA in college are respectively:

+.374, +.360, and +.467 (Table 4.4). When *n* Ac is added, the multiple correlations between CEEB scores + *n* Ac with GPA in college are respectively: +.403, +.396, +.500. As hypothesized, therefore, both variables together have a higher predictive value, although this value is only moderately higher.

Very similar findings are obtained in the case of the GPA in high school. As we have seen (Table 4.4), the single correlations for all students, for males, and for females, between GPA in high school (variable 26) and GPA in college are respectively: +.541, +.525, and +.628. If *n* Ac is added, the multiple correlations between GPA in high school + *n* Ac with GPA in college are respectively: +.552, +.542, +.651. Again the predictive value is moderately higher.

We should note that the multiple correlations between average CEEB scores + GPA in high school with GPA in college for all students, all boys and all girls are respectively: +.569, +.556, and +.662. Since both variables intercorrelate so highly, these multiple correlations are not much higher than the ones just presented (preceding paragraph) between GPA in high school plus *n* Ac, with grades at the end of the first year in college.

Some data on the other variables investigated will be offered under the headings that follow, but let us report at this moment that the best multiple correlations with regard to GPA in college from all the combinations we have tried, using 2, 3, 4, and *more* variables, are the multiple correlations of the three variables just discussed, and the GPA. Their values are the following:

Table 4.5

Best multiple correlations

Av. CEEB scores + High School GPA + *n* Ac = +.573 (all students)

Av. CEEB scores + High School GPA + *n* Ac = +.556 (all boys)

Av. CEEB scores + High School GPA + *n* Ac = +.676 (all girls)

Since the correlations apply only to the undergraduate schools of Georgetown, there is no need to give the beta coefficients (or partial regression coefficients) and the standard error of the data, of the estimate, and of the coefficients. It is obvious that these multiple correlations are very substantial, especially for female students. Similar values were found for the correlations within each undergraduate school.

Other Personality Variables

As explained in chapter 3 numerous other variables have been investigated. Again only the main findings will be reported. *Positive* correlations were found between grades in college and measures of religiosity, of the hours of study per week, right choice of major according to the Strong Vocational Interest Blank, and the ratings by the Principal of high school and Teacher. *Negative* correlations were found with neuroticism, according to the MMPI and the TAT, with the students' report about their psychological and physical health, their religious affiliation, their living off campus, and with the number of hours of extracurricular activities.

Not all these relationships are significant. The correlations of those variables which are *positively* and significantly related with GPA in college will be given in parenthesis (for all students, the boys, and the girls, with * or ** attached if they are beyond the .05 level or the .01 level). Attitude toward religion (+.137**, +.143**,

+.079), religiousness (+.122**, +.133**, +.058), frequency of Holy Communion (+.117**, +.123**, +.066), total hours of study per week (+.113**, +.115**, +.081), Principal's ratings (+.304**, +.315**, +.289**), and Teacher's ratings (+.284**, +.296**, +.208**). All these variables correlate also positively with n Ac and GPA in high school. This is why they add very little to the prediction of academic performance in college. The various measures of religiosity, or religiousness, are significantly related with grade-point average in college for the male, not the female, students. This pecularity also holds true with regard to the relationship between n Ach and religiousness. It appears that in girls these variables do not affect grades or motivation to any significant degree. This is another difference between the sexes of this sample, although it could be attributed to the fact that girls as a whole are more religious, the range or variation in their religiosity is not so large (the low ënd has few subjects) and, therefore, there is more homogeneity in the female sample.

The significant negative correlations between other variables and college GPA, for all, for boys and for girls (with their levels of significance: * ** beyond .05 and .01 respectively) are the following: the students' report that poor psychological health prevents them from studying efficiently (-.103**, -.084*, -.196**), and the number of hours dedicated to extracurricular activities (-.093**, -.091**, -.071). The less healthy they are psychologically or the more hours of extracurricular activities that they report, the lower the grades obtained. It should be noted that psychological health, according to the MMPI or the TAT, is not related to grades significantly. However, psychological health according to the TAT is significantly and negatively related to n Ac (-.397**, -.446**, -.220**).

This variable will receive more attention later in the chapter.

2. Sociological variables

In this study, age, parents' educational and occupational level, combined annual income, private versus public high school, discipline at home not by the father, non-American nationality, and less happy home life, are negatively correlated with grades in college. The combined annual income was classified in the following manner: less than $8,000 = 1, from $8,000 to $12,000 = 2, from $12,000 to $20,000 = 3, and above $20,000 = 4. The mean income for all, for boys and for girls was : 2.88, 2.90 and 2.85 (std. dev. in all groups less than 1.00) and the corresponding correlations were: -.155**, -.164**, -.086, showing that, particularly for boys, social class as measured by income, is inversely related to academic performance.

Previous studies concerning these two variables (parents' income and grades) have reported apparent contradictory results: in some studies, social class appears directly related, and in some others inversely related, to performance (see Lavin, 1965, pp. 122 ff.). Lavin's explanation for this inconsistency may be apposite:

> The situation is probably as follows: The relationship between SES (socio-economic status) and academic performance is positive through most of the SES range, but at the upper SES levels, it is inverse. When the SES sample does not include this *upper segment*, positive relations will be found. When the sample does include the upper range and *does not go below* the middle class, inverse relations will be found (*Ibid*., p. 126).

McArthur (1960) has given attention to this question and asserts that the Eastern *upper* classes hold values that are not consistent with the American success orientation, for they stress the past rather than the future as the important time, and "being" a gentleman or "keeping" the status, over achieving as the important aspect of the person. It is probable, as Rosen (1959a) and many others have shown (Crockett, 1962; Veroff et al., 1965) that the upper class does not stress achievement motivation as highly as the middle class. But, more generally, it appears that socioeconomic class may be a significant variable in academic performance because it summarizes systematic variations in other factors such as attitudes, motivation, values, intelligence, etc., that are related to such performance.

It is interesting to note that a happy home life is positively related to n Ac in boys (+.128**) but negatively in girls (-.076). Very likely some family and personality variables that are predictive of academic performance are qualitatively different for males and females. Some of the possibilities we have mentioned, as well as the entire field of sociological variables (and in particular socioeconomic status) suggest very strongly the need for serious and further research on the relationships between these variables and academic performance with regard to both sexes.

3. Exclusions of variables

In the findings reported thus far, academic motivation or n Ac was computed for all the students about whom we had complete data on the other variables. This means that, as previously indicated in chapter 3, all the TAT protocols were used without excluding those subjects with serious omissions in the stories, or who wrote very little and did not give to the test the required minimum effort and attention. Veroff et al., (1960) in their national survey of motivation (1,619 adults, 21 years old or over) introduced a correction in those protocols which contained very short stories, and excluded from the computations the protocols which had omissions which they considered either serious or possibly serious: those which had two or more inadequate responses in one or more stories. We have not done so, and, very likely, if the length and completeness of the protocols had been taken into account our results would have been more positive.

A confirmation of this probability are the following data. While scoring the TAT stories for n Ac, those protocols which created in the scorer a very strong impression that the student was being very uncooperative, were assigned a special rating, as well as those which contained very incoherent, negative, unrealistic and so to speak 'neurotic' stories. Many of these protocols were also incomplete in one or more stories. If we exclude these cases, the simple correlations between n Ac and academic performance in college, as well as the multiple correlations between motivation, other variables, and performance in college are consistently higher. Table 4.6 shows some of the simple correlations between n Ac and GPA in college after excluding all these students.

Table 4.6

Relationship between the n Ac of all freshmen and of selected freshmen with GPA at the end of first year in college

Samples	Total n Ac	Total IBO	Total I
All students (N=957)	+.103**	+.111**	+.117**
Selected St. (N=614)	+.152**	+.159**	+.159**
All males (N=772)	+.072*	+.084*	+.090*
Selected m. (N=459)	+.139**	+.145**	+.147**
All females (N=185)	+.231**	+.239**	+.250**
Selected f. (N=155)	+.226**	+.251**	+.276**

We have included in Table 4.6 the data of the entire samples for purposes of comparison. All correlations in the selected samples have increased greatly. In particular, the subcategory of Instrumental activity once again is the most positively related to academic performance. It is suggestive to note that over ten times more boys (313) than girls (30) have been excluded in the selected samples. The sample of boys was reduced by 40 percent, but that of girls by only 14 percent. It seems that female students followed the test's instructions better and were more cooperative and less "neurotic" in their stories.

Table 4.7 presents some of the multiple correlations for this sample of selected freshmen.

Table 4.7

Multiple correlations between various variables and college GPA

Variables	All students	Boys	Girls
Av. CEEB + HSGPA + n Ac	+.590	+.577	+.679
Av. CEEB + HSGPA + n Ac + Religiosity	+.591	+.575	+.681
Av. CEEB + HS rank + n Ac + Religiosity	+.564	+.530	+.662
Av. CEEB + HSGPA + n Ac + H. Communion	+.589	+.563	+.679

If the multiple correlations in the first line of Table 4.7 are compared with those in Table 4.5, the correlations for this selected sample are higher, but only slightly higher. Table 4.7 shows also that very little predictive value is gained by adding a fourth variable (religiousness, frequency of Holy Communion) or by replacing the converted rank in high school for the GPA. The same remains true (as we mentioned before) if other variables are introduced, such as Principal's or Teacher's ratings, and the Verbal, the Math scores, or both of them separately (not combined). If instead of the total n Ac, only I is used, the multiple correlations are somewhat higher.

We need to indicate, finally, that in a further screening of this selected sample we excluded non-American students, those who considered themselves less healthy, those with unhappy home life, with the lowest scores in religious variables, and with very high scores either in family income or in the number of extracurricular activities. For this second sample the correlation between total n Ac and GPA in college reached the value of +.287** (versus +.152** in the previous sample and +.103** for all students, see Table 4.6). However the sample comprised only a total of 174 students. No conclusions should be drawn from this rather small and somewhat artificial sample. It only shows that many and complex variables contribute to obscure the relationship between n Ac and performance in college.

Males versus Females

All the findings reported have manifested the multiplicity of variables that can be related, directly or indirectly, to success in academic performance. Not all these variables have been studied, and even the ones analyzed are, undoubtedly, very complex. The most general conclusion concerning the findings, seems to be that both intellective and non-intellective variables (and, among the latter, academic motivation) are significantly related to success in college as measured by the grade-point average. This would explain why the grade-point average obtained in high school, which contains both intellective and non-intellective factors, has been found to be the best single predictor of achievement in college. Another conclusion is the consistently higher relationships in female students between some of the variables studied (GPA in high school, CEEB, n Ac) and academic performance in college. This conclusion confirms many other studies assessing the relationships between sex and academic performance (see v.g., Lavin, 1965, pp. 128ff; Jackson, 1955, pp. 296-301). Females attain higher academic performance than males. In our study, the mean grade-point average for all males was 2.50; for all females: 2.58. In the Foreign Service School where selectivity for females is very high, and the mean n Ac as reported above also very high, the grade-point average for females was 3.16 while that for males was 2.61. Other studies have also shown that for females multiple correlations among different variables and grades in college are higher than for males (Abelson, 1952; Scannell, 1960; Birdie, 1961). There is little doubt that college academic performance is more predictable for female than for male students. In particular, as we have found, intelligence and high school grade-point average, or high school rank, correlate highly with college grades.

It is difficult to give valid reasons for the differences between sexes and, in particular for the higher correlations, in female students, that we have consistently obtained. In all likelihood the findings can only be understood in terms of a very complex variety of differences in attitudes, values and behavior which result from biological determinants and mostly from the fact that males and females are socialized differently. We propose the following considerations as plausible explanations for the findings obtained in this study. But no attempt is made to extend these explanations as applying equally to other samples, and undoubtedly all these questions need further research and more comprehensive, as well as longitudinal, studies.

1. Most girls in our sample (157 from a total of 185) came either from the School of Nursing (87) or the School of Languages (70). In the School of Nursing all students take the same courses, taught by the same professors, during the first year. A very similar (although not identical) situation is found in the School of Languages. There is, therefore, much less variability, in course content and professors,

for females than for males, with the consequent less variability of subject matters and of different criteria in grading. The male students belong to the College (434), and the Schools of Foreign Service (195), Business (100) and Languages (43). In the College alone they select Bachelor of Arts in general or pre-med, as well as Bachelor of Science with majors in Chemistry, Biology, Physics, and Mathematics. Many other majors are also available. There is a much greater source of variation deriving from a much greater number of courses and different professors. In chapter three we mentioned these and other factors as possibly affecting the grade-point average and its correlations with other variables. Since all these factors more often apply to males than to females, they could account for some of the differences we have found.

2. As we suggested, in Georgetown University there is more selectivity regarding girls than boys. The CEEB scores of the 28 girls in the School of Foreign Service is the highest in any group of the entire freshman class. The School of Languages also has more rigid criteria for selecting girls than boys, and, as a result, they have a higher CEEB average than the boys. Similar high selectivity applies to the School of Nursing. This factor of higher selectivity can also account for some of the differences. One example will suffice. The ratings by the Principal and the Teacher from high school have these means and standard deviations for the boys: 4.1, 4.2; .64,and.67 while for the girls they are respectively: 4.3, 4.4; .59 and .62. The means are higher for the girls and the standard deviations smaller.

3. We reported that the number of hours dedicated to extracurricular activities was inversely related to grades or academic performance. The mean number of hours spent by the boys in extracurricular

activities is 16.43 (std. dev. = 11.17), the mean for the girls: 12.55 (std. dev. = 8.79). The same trend is true with regard to the number of hours dedicated to study. These factors could also account for the findings that girls perform better academically. They, so to speak, produce more in accordance with, or within the limits of, their potentialities.

4. A more important explanation for the differences found may be the following. As we showed in Table 4.6 with the selected sample of students, many more boys than girls were excluded from this sample for being less cooperative while taking the tests and for leaving more questions incomplete and writing more 'neurotic' stories. This lack of cooperation may explain why the correlations were less significant for male students. In connection with this aspect the quotation from Lavin that follows may be pertinent:

> Because academic success for males is considered more significant in terms of later occupational success, family pressures on them to do well in school are probably stronger than they are for females. If academic success is more directly involved with the male's affective ties to his family, the school might be more likely to become an arena in which either compulsive conformity to, or rebelliousness from, parental expectations may occur (Lavin, 1965, p. 130).

Either compulsiveness or rebelliousness may, then, lead to poorer performance or to lower correlations among the variables studied.

5. The above consideration is related to another aspect which may be the most significant. As many studies have suggested (v.g. Lesser, 1964, McClelland, 1965c) we need a differential psychology of motivation for men and women. It appears that "thought relates more to operant action in males than females and more to respondent action in females than males" (MCClelland, 1966, p. 481). Respondent measures such as performance tests, answers to examinations, questionnaires, etc.,

may, therefore, have some advantage for women over men. In other words, women are probably more "contextual," more "other directed" than men, more influenced by their surroundings, including the test instructions, and therefore, more cooperative and respondent. Teachers may also grade them more benevolently. Men, on the other hand, may be more apt to act out their fantasies and to behave in a more independent and less conforming manner.

6. We reported in the preceding chapter that creativity was not highly related to academic performance, that outstanding scientists often did not receive outstanding grades in college. Male students, as a whole, may be more creative, and their academic potential may not be reflected in their grades as accurately as it may be reflected in women. It is also probable that our measure of _n_ Ac has different functional relationships for men and women. Likewise, as some studies have shown (for instance, Field, 1951; Atkinson, 1966), very likely female motivation is less often separate or independent from social acceptability. Poor grades and poor performance can be a cause of greater concern and avoidance (because of their social implications) for females than for males.

7. We may also speculate that the model of a good student is a female model. Female teachers, in elementary and high schools, far outnumber male teachers. If the "good" student is truly a female model, then, for the male, deviation from the student role actually constitutes a confirmation of his masculinity. T. Parsons (1949) made use of this consideration in an attempt to account for certain patterns of aggressive behavior. It may also account for different patterns of academic behavior.

8. Finally, there is some evidence that the females of the

present study were a much more homogeneous group than the males. We have already mentioned the lesser variability found in them in such variables as courses, professors, number of extracurricular activities, hours of study, and ratings by Principals and Teachers. In addition, the standard deviations for most of the variables studied (e.g. religiousness, CEEB scores, high school GPA, etc.) are always lower for girls than for boys. This greater homogeneity in the female students may also account for the more "homogeneous" results.

If all or some of these explanations have any validity, they can shed light on the differences obtained and on the reasons why academic performance is, in fact, more predictable in females than in males. However, although it is interesting and suggestive to speculate about the factors underlying the sex differences, more research and evidence are needed, in particular through longitudinal studies, and more attempts by behavioral scientists to begin to build upon solid ground the differential psychology of motivation for men and women.

CHAPTER FIVE

MAJOR LIMITATIONS

General Comments

The results and findings presented in chapter four have indicated the moderate success achieved in this investigation. Other positive contributions will be discussed in the next chapter. Here we will concentrate on the shortcomings and major limitations of our research. We have measured a variable, n Ac, that is positively related to academic performance, but although most of the correlations we have obtained are significant, they are low, sometimes very low. We investigated academic motivation in the hope that it would have greater predictive power toward academic performance in college than, for instance, the academic potential of the students as measured by the CEEB scores. In this aspect we have not been successful. The CEEB scores, and most of all, the GPA attained by the students during their years in high school, have a much greater predictive power than the variable, n Ac, we have studied. We have confirmed again that past academic performance as reflected by the grades obtained in high school is the best single predictor of the grades to be achieved in college. In addition, contrary to our expectations, the motivational variable does not appear to be clearly unrelated to intelligence in female students. We were trying to isolate a non-intellective variable but cannot be sure of having succeeded. Probably all variables, intellective as well as non-intellective, are personality variables and therefore inter-dependent or inter-related. In the following pages we will attempt to find some explanations for these and other limitations in the research findings we have reported.

The Criterion of Academic Performance

This is the first consideration that comes to mind when reflecting upon the reasons that could account for the low value of the correlations. In order to validate *n* Ac we have used grade-point average, a criterion which, as explained in chapter three, is far from adequate. It still remains probable that *n* Ac may be a valid measure of true and relevant academic motivation, for those students who are high in this variable may be more creative and more deeply academically oriented than their moderate or poor grades in college would lead us to believe. It may be that *n* Ac is highly related to significant aspects of the academic professions *after* completion of school. As we mentioned, students with high grades are not always the best scientists. However, we have no evidence in this direction and these thoughts may be a *post hoc* explanation, an attempt to dismiss the conclusion that our findings have been only moderately positive. Two facts, however, are clear: (a) behavioral and educational scientists are in increasing agreement that college grades are far from being an ideal, or even trustworthy, criterion of academic achievement; (b) we have indeed uncovered a consistent trend in the findings, showing that either globally or by the separate undergraduate schools, *n* Ac correlates more positively with the grades in the *second* than in the first semester; if this trend were to hold true for all the following semesters, *n* Ac would have a greater predictive power for the four years of college than for the first year, the only year we have investigated. We might add that this trend of better correlations with the second than first semester (between *n* Ac and grades) was not found with regard to CEEB scores and to GPA in high school. If this were confirmed through the following years, *n* Ac could be a truly predictive and relevant variable. However, in female students n Ac and the second year grade-point average did not show this increasing trend (nor a decreasing one). The only inference that can be drawn at this moment is the advisability of continuing this investigation on the relationships between n Ac and the grade-point average, during each successive year and at the end of the four years of college.

Time of Testing

The particular time at which we tested the students for academic motivation was, unfortunately, very inadequate or not propicious. The tests for motivation were given on a Saturday, four days after the freshmen arrived on campus, during the so-called 'Orientation-Week' and,most of all, before they had attended any classes in college. This we consider a very improper procedure. It was convenient to do so, it was, practically, the only way of getting all students together under similar conditions, but we are, and were, aware that this procedure had many shortcomings and limitations. Since the tests were given on Saturday, after various days of long sessions of other testings, of orientation lectures, and in the midst of so many novel emotions and new surroundings and situations, the students were not in the best frame of mind for another session of tests and on such a day. More important, if valid, the motivation we measured cannot be called "college academic motivation." The freshmen had no real knowledge of college academic life, of its special demands and its differences from previous academic settings. Strictly speaking, we measured, either a) high school motivation, b) motivation before college, or c) their unrealistic aspirations with regard to their future academic performance in college. Had the tests been given after a few weeks or months of college life, the chances of having measured a more realistic (and probably more valid) college academic motivation would have been much higher. In addition, the fact that the testing took place during the very first week in college when most of the students had just begun to be away from their families for the first time, was also a further shortcoming in our procedure. While scoring the TAT stories we were constantly reminded of this particular limitation. A great percentage of the stories contained strong feelings of homesickness, of the fact that they were away from home for the first time. Had we measured the need for affiliation of the students, it would almost certainly, have been high, much higher than under more normal or usual circumstances. Very likely this prominence of homesickness in their minds and hearts, and feelings of affiliation, prevented the students from more accurately revealing, in their stories, their true academic motivation.

There is little doubt that because of these and other circumstances we did not obtain a pure measure of n Ac. At least we cannot be sure of having obtained it. We cannot defend our procedure (adopted as a lesser evil because of its practicality and convenience) but many of these limitations in the testing situation could account, in part, for the moderate success attained in the study. It is our intention to give the same TAT test, within the first semester of their senior year, to two samples of students from the same freshman class comprising, approximately, 150 males and 100 females. By doing so, among other purposes, we expect to achieve the following objectives: (1) the limitations of the first session of testing will not be present; (2) we will be able to analyze whether or not the new measure of n Ac correlates more positively with the grades at the end of the seventh and eighth semesters in college, and whether or not it would have correlated better with the preceding semesters; (c) an opportunity will be afforded to determine the reliability of this motivational variable as measured by the TAT test. We know that the test can be reliably *scored* but we need to know whether or not, with some degree of consistency, it measures the variable it is supposed to measure. A further objective or purpose, the most basic one, for testing the students a second time will be explained in the next chapter.

Nonlinear relationship

Correlations between two variables and multiple correlations have been the main statistics employed in this investigation. It must be remembered, however, that the Pearson correlation reflects only the *linear* relationship between two variables. We have assumed this linearity in the relationships, but very likely we were not fully justified to do so. In general, the higher the CEEB scores, the higher the grade-point average in college, but as we have noted in the preceding chapter, we found just the opposite in male students regarding *n* Ac. The higher the CEEB scores of the students, the lower was their mean *n* Ac. The relationship between these two variables appeared to be *nonlinear*, and the low correlations obtained (between *n* Ac and GPA in college) may mean either a low relationship between the variables or simply a *nonlinear* relationship. It is probable, since for female students the correlations between *n* Ac and CEEB scores are more linear, that for this reason the correlations between either of these two varibales, or both of them, with the college GPA turned out to be higher and more significant. *N* Ac, if linearity cannot be assumed, may still be a very relevant variable with regard to academic performance despite the low value of the relationship obtained.

There is also further evidence, this time with regard to the motivational variable (n Ac) alone, that the association between academic motivation and academic performance is nonlinear. Many studies in achievement motivation (n Ach) have shown that two aspects of motivation are included in the variable: hope of success and fear of failure (see Atkinson and Feather, 1966; Heckhausen, 1967). The same probably applies to n Ac. Situational stress, for instance, (in our case, examinations) has been shown to be detrimental to failure-motivated subjects but beneficial to success-motivated subjects (Bartmann, 1963). Consequently, high scores in n Ac may lead to either higher or lower grades depending on whether or not the student is motivated for success. Many recent studies, in order to better differentiate the two aspects of motivation, are selecting as persons high in n Ach only those with high scores in this variable and low ratings in anxiety scales. We have not done so. It is probable that our 'highs' in n Ac were not high in what is called 'resultant' motivation or success motivation. If the students who were high in n Ac were also high in anxiety, the relationship between n Ac scores and grades was very probably nonlinear. This aspect needs further investigation.

The above considerations are only an application, to our measure, of the more general and widely known Yerkes-Dodson Law. Experiments have shown repeatedly that the relationship between the strength of the motive and the level of performance is curvilinear. As motivation increases performance also increases, but only up to a point, after which it decreases, sooner and more steeply as the task to be performed is more difficult. That this law is applicable to our study will be made more apparent by the considerations under the next heading and in the further aspects to be discussed more fully in the following chapter.

Concern and Motive

The major limitation of this research project (and at the same time, from another point of view, its most positive contribution, see chapter 6) is the strong conviction we now have that we have failed to measure motivational variables properly speaking. This statement applies not only to this and previous research conducted by us (Cortés, 1961; Cortés and Gatti, 1966) but also to most of the studies conducted in the field of human motivation, in particular to those using projective measures and scoring need for achievement, need for affiliation, and need for power. By following the definition of n Ach and adapting, it, we defined n Ac as 'desire to do well in school,' 'competition with a standard of academic excellence,' 'concern over academic accomplishments.' We also constructed a Manual for Scoring n Ac in the pattern of those for n Ach, n Aff and n Power. According to this method for scoring motives, when the characters in the stories showed concern over academic excellence, when they stated desire to do well in school, or were dreaming about becoming prominent professionals and anticipating success in the academic professions, we scored all these ideas, thoughts or imagery as signs of n Ac. But we are now very doubtful that these scores can be considered as real signs or measures of motivation. We believe they are all signs of concern, not necessarily of motivation. The reasons for this conviction are based both on experimental findings and theoretical considerations.

Experimental findings. In Table 5.1 we present the correlations between total n Ac, two of its subcategories: instrumental activity (I) and statements of need (N), and the GPA at the end of the first year for all the students, and for all males and all females separately.

Table 5.1

Correlations between *n* Ac, I, N, and GPA in college

Populations	Total *n* Ac	I	N
All Students N = 957	+.103**	+.117**	-.022
All boys N = 772	+.072*	+.090*	-.031
All girls N = 185	+.231**	+.250**	+.092

The Table demonstrates that although *n* Ac, and in particular the subcategory of Instrumental Activity, correlates positively and significantly with academic performance as measured by the GPA, the opposite is true of the Need subcategory: the correlations between N and GPA are either negative or nonsignificant. In the next chapter more detailed data will be presented with identical trends. Total *n* Ac is the sum of a number of subcategories some of which are positively related to academic performance/ while others are negatively related to academic performance. The reason is that, as stated, what we have measured is *concern* about academic excellence, not academic *motivation* proper. Some of the subcategories are more related than others to overt action and behavior. Let us present an example. The following sentence is taken from one of the TAT stories (in Atkinson, 1958, p. 701) to picture 5 of our test (Appendix I): "A boy is dreaming of becoming a doctor when he grows up." The expert scoring given in the book states that it contains AI and G+. Atkinson comments: "Here the boy is daydreaming about becoming a doctor right off the bat, so *it is easy* to score Achievement Imagery" (*Ibid.*, p. 722). According to the Manual in Appendix II, identical scoring would have been given for *n* Ac. But it is not difficult to realize that the character is only *dreaming* about becoming a doctor, he shows some interest and concern over this academic profession, but not motivation proper. Most boys also dream of becoming doctors but in reality few obtain an M.D.

The above consideration touches on a very important psychological problem. The recent and important article by A. Skolnick, "Motivational Imagery and Behavior Over Twenty Years," (1966) demonstrates that imagery and behavior are indeed related, but not in a simple and straightforward manner. McClelland (1966) commenting on Skolnick's paper in the same issue of the Journal of Consulting Psychology, affirms that he prefers "now to speak of a 'concern' rather than 'need' (or motive) because the latter suggest a directional tendency that one cannot often infer very well from the thought content" (Ibid., p. 480). He proposes no solutions for clarifying this basic question, and adds that the concern may mean that the person's thoughts frequently turn to the particular topic, or also that the thoughts will, with some likelihood, be represented by behavioral actions. He, then, goes on:

> What all this points to is that we must stop arguing about such global generalizations and get on with the business of defining under what conditions correlations between thought and action will be positive, negative, or nonexistent. This essentially reduces what has tended to be a special problem in the literature of psychology to the more general problem of understanding the conditions under which any two types of responses are related to each other (Ibid., p. 480).

Similar considerations are also put forward by Lazarus (1966). It seems imperative to try to distinguish between imagery that is a mere substitute for behavior and imagery that is or may be directly related to behavior. In view of the data we have obtained probably some light may be shed regarding the question of under what conditions correlations between thought and action will be positive.

Theoretical considerations. We had the feeling, or incipient belief, while writing the Manual for Scoring (see Appendix II), that very likely the subcategory of Instrumental Activity would better reveal real motivation than all other subcategories. The evidence presented in Tables 4.1, 4.6, 5.1 (and the data to be offered in Table 6.1) shows the correctness of that belief. The following theoretical considerations also support it. A motive, as dictionaries define it and the etymology (from the Latin moveo, to move) shows, is "something that prompts a person to act," a concern, a want that moves, that leads or impels to action. It is here, in activity, in actual striving and doing, that the essential characteristic of motivated behavior seems to lie. The Instrumental Activity measured in the stories is covert, or mental, activity, as well as actions taken by the character to attain the goal, and when this type of imagery is present we must be closer to motivation, to the conditions under which the relationship between thought and action will be more positive. Thoughts that lead one to act, that include action or activities, will be more related to action in real life than thoughts or images that merely contain wishes, dreams, feelings, emotions or interests. In our opinion, this is the main limitation of the present study and of all similar studies. We need a new method of scoring that will better discriminate between those thoughts or images that are signs of inner, or mental, motivated behavior, and those thoughts or images that are mere signs of concern, of simple desire to do well in the academic or other fields. Both concepts, concern and motive (or need), are not mutually exclusive, but they are far from being equivalent or mutually inclusive. We have measured only concern over academic accomplishments. Because concern may also contain true academic motivation, the correlations obtained between n Ac and academic performance were positive. Because concern only partially contains motivation (it also includes wishes, dreams, interests, ideas, that may be a substitutive of real motivation) the correlations with academic performance have been rather low or moderate. In the next chapter this important question will be treated in more detail.

Complex variables

This study has also confirmed another limitation that applies to this type of studies and was predicted in advance. Motivational variables are always personality variables, that is, variables interrelated with the many factors that contribute to the personal characteristics of every individual. We expected, and found, a large amount of overlapping between the variables. Religiousness, psychological health, the number of extracurricular activities, interests, intelligence, and many other personal characteristics, are related one way or another to both academic motivation and academic performance. Other group of factors, the ones we labelled sociological, such as age, sex, annual income, parents' education, and many more not explicitly mentioned or emphasized, such as cultural, rural, or urban background, previous private versus public schooling, even living on or off campus, etc., affect the personality and motivation in differing ways and have always some bearing on academic performance. Even if we could more properly isolate real academic motivation, the correlations with performance will never reach a very high level of direct association.

That the relationships between motivation and performance, given so many contributing and obscuring factors, are indeed very complex, was shown, in particular, by the samples we presented of selected students. We first excluded those subjects that did not appear very cooperative or psychologically healthy, and second, those from the upper segment of social class, above average in the amount of extracurricular activities, or very low in their religiousness, academic interests pertinent to their own field, etc. By this screening process we were able to show more clearly some of the relationships between motivation and performance. However, further research and more adequate procedures are needed in order to clarify the interdependence, and the varying relationships, among the many factors that have some bearing on the complex question of academic success in college.

N Ac and length of the Stories

One final limitation that merits comment refers to the probable relationship between the length of the TAT stories and measures of motivation. At least six studies, dealing mainly with *n* Ach but some also with *n* Aff and *n* Power (cf., Ricciuti, 1954; Ricciuti and Sadacca, 1955; Walker and Atkinson, 1958; Child, Storm and Veroff, 1958; Veroff *et al.*, 1960, and Skolnick, 1966) have reported positive correlations between the number of words in the TAT stories and the scores on motivation. These correlations vary from +.20 to +.59. Veroff *et al.*, in their national survey on motives, wrote:

> Clearly some correction of the raw scores is necessary in order to eliminate the fact that a person who tells longer stories stands a greater chance of obtaining a high score based on a frequency count of particular kinds of motivational content in what he has said (*Ibid.*, 1960, p. 13).

Accordingly, they introduced a correction factor based on the average of the correlations found between the motives studied and the length of the protocols. Skolnick (1966) also introduced a similar correction factor in her measurements of motivation. The effects of such corrections appear to have been beneficial for they diminished differences attributable to variations in verbal fluency and revealed more clearly real differences in motivation. Veroff _et al_. (1960), concluded:

> One problem of considerable importance, the relationship between motivation scores and length of imaginative protocol...seems to have been adequately overcome (_Ibid_., p. 29).

We have not introduced such a correction in our results, and it is very probable that the verbal fluency of the students was positively related to their scores in _n_ Ac. Likewise, as previously noted, we did not exclude in the total sample (nor directly in the selected sample), those students with inadequate or incomplete protocols. This may be another reason why the findings have not been more positive. All these aspects will be taken into consideration in the second stage of this project.

Some additional limitations could still be pointed out but those discussed are probably the most relevant. Some readers might wonder about this candid report on our own shortcomings and even experimental flaws, but we felt that scientific honesty demanded such probing and self-criticism. We also wished to let readers know that we are the first in recognizing some of our limitations and in realizing the need for further investigations in this same area.

CHAPTER SIX

POSITIVE CONTRIBUTIONS

Need for Academic Achievement

Despite the limitations and shortcomings discussed in the preceeding chapter, many positive findings have been obtained, and, in general, the hypotheses and predictions that were made in chapter two have been fully confirmed. More important in our opinion, however, are the many leads, the new hypotheses and promising trends that this study has uncovered. In the present chapter we will discuss briefly various aspects concerning either the confirmation of our initial predictions and hypotheses, or the hopeful indications that many of the findings seem to hold for future investigations in the entire field of human motivation.

We have employed a new tool for measuring a new variable, n Ac, and have shown that this motivational variable is significantly related to academic performance in college. The correlations obtained between n Ac and GPA have been consistently positive, for all students, for both sexes, in all and each of the undergraduate schools of the University. All this in spite of the many sources of uncontrolled variation deriving from the large variety of courses and professors, from the differing personal and sociological factors in the students, and from the shortcomings in the adopted criterion for measuring academic performance. The variable we have studied does contribute to success in college, and as far as we know, this is the first time that the specific motive, n Ac, has been measured by projective tests.

More particularly, n Ac discriminates the high achievers from the low achievers, even at the various levels of ability and performance as we showed in Tables 4.2 and 4.3. The difference in the mean *n* Ac for male and female students between the very high and very low achievers was very significant, at least beyond the .01 level of confidence. In addition, *n* Ac has shown the promising trend of *higher* correlations with the college GPA of the second semester than with the GPA of the first semester, as if indicating that as time passes and the demands of college life are better known and assimilated by the students, the influence of this motivational variable becomes more apparent. We cannot yet consider *n* Ac as a fully validated measure, but further research may reveal that this is indeed the case.

Specific dimension

As noted in chapter 1, there is little doubt that *n* Ach is a multidimensional construct in which many types of achievement are included. It was clearly advantageous to isolate some of the more specific dimensions such as *n* Ac, or the academic motive, and our investigation has attained moderate success in this direction. The Manual for Scoring *n* Ac is reliable (interscorer agreement reached +.96) and the analysis of this particular variable has shed light on some of the inconsistencies that previous investigations between grades and the achievement motive had revealed. We should add that about 400 stories were scored both for *n* Ach and *n* Ac. The relatively low intercorrelation obtained between these two variables (+.24) suggests that although, as predicted, *n* Ac remains as one of the many dimensions of *n* Ach, it shows clear promise of being more directly related to aspects of the particular area of academic achievement. However, the 400 stories mentioned were written in answer to two similar but differing sets of pictures (4 to each set), and in order to verify this finding of low intercorrelations, the scoring for both *n* Ach and *n* Ac should be carried out with stories to the same pictures. Nevertheless, since the Manuals for Scoring are based on different theoretical principles, there is reason to believe that we have been measuring a separate though not entirely independent variable. Various findings reported in chapter 4 point in this direction. Another confirmation of this point of view may be the following. Persons high in n Ach select more often business careers and do better in them (chapter 1). If the two variables were identical, the students in our sample who were attending the School of Business should have been higher in n Ac than those from the other schools. This was not the case. The mean n Ac for these students (N=100) is 11.04, versus 11.24 for the College (N=434), and 11.47 for the School of Foreign Service (N=195).

CEEB and N Ac

Academic motivation has been shown to be unrelated to academic potential (CEEB scores) in male students. This finding differs from those obtained with n Ach and may be a significant contribution. Both variables (n Ac and CEEB scores) are positively but independently related to performance for the intercorrelation is negative. Thus, the multiple correlations between CEEB + GPA in high school, on the one hand, and n Ac + GPA in high school, on the other hand, are associated, to almost the same degree, with GPA in College (for male students the multiple correlations are +.556 and +.542, respectively). If instead of the total n Ac we had used the subcategory I, the value of the multiple correlations would have been practically identical. We are very confident that by following the improvements in measuring n Ac to be explained below, this variable (together with GPA in high school) can have a greater significant value in the prediction of academic performance than the CEEB scores. At present the CEEB scores contribute little to the prediction due to their high correlation with the GPA in high school (+.322).

We consider as a positive contribution the finding that male students in the high ability level (upper third in CEEB scores) have a lower mean n Ac than those in the medium and low ability levels. One could draw the inference that between two students with the same GPA in high school, let us say B+, but who belong to the medium and high ability levels (for instance, in the 600's and 700's average CEEB scores) the student in the medium ability level might be a better risk from the point of view of academic performance. This is in aggreement with an assertion by Heckhausen already quoted in another chapter:

> ...from a certain high degree of native ability on up, improvements in intelligent performances is promoted more by increases in the strength of motivation than by increases in the level of native capacity which is already high...(1967, p. 129).

If motivation is lacking, a higher degree of native ability is not a guarantee of better academic performance; and chances are that in the high levels of ability a high level of motivation is not so common. Very likely, as Edison put it,"perspiration" (or motivation) rather than "inspiration" (or ability) accounts for greater success in most aspects of life, and consequently in academic life as well. If motivation and ability are inversely related in males, and on the other hand we may suppose an adequate level of ability in those institutions of higher learning which employ strict criteria for admission, further analysis of this inverse relationship between motivation and ability becomes more imperative. It is of great importance to find out whether or not the negative correlations between these two variables are also true during the high school years. Most of all, it may be extremely relevant to devise methods of increasing the amount of academic motivation in those students with high degree of native ability.

Males versus Females

Another aspect to be emphasized is that of the differences encountered between male and female college students. Our study has dealt with both sexes (probably for the first time with projective measures of motivation in female college students) and has confirmed many previous investigations. The great need for a differential psychology of the sexes and in particular of the differential motivation for men and women is becoming apparent. Some variables (v.g., the CEEB scores and the high school grade-point average) correlate more highly, in females, with academic performance. In particular, contrary to what was found in the males, n Ac correlates positively with academic potential. This finding may be significant but there is need for further investigation. An attempt to explain some of its aspects was made in the last pages of chapter four. However, our sample is not representative since it was restricted to undergraduate students of only one University. Students from other institutions should be tested. We do not know of previous studies reporting differences in males and females between motivation and ability, but, if confirmed, the findings could be a promising contribution toward the differential psychology of motivation.

In confirmation of other studies, but possibly using more adequate controls for ability and performance, we should report that an analysis of the number of students in the cells of Table 4.3 reveals that, from those in the high GPA level and who belonged to the high ability level, 48.6 percent of the boys attained the expected achievement; the percentage for the girls in the same categories was slightly higher: 50.8 percent. Of the boys, 29.8 percent were classified either as low or very low achievers (cells 1, 2, 6); of the girls 23.2 percent were so classified in the same cells. Similarly, 28.9 percent of the boys were classified as high or very high achievers, while 30.8 percent of the girls were so classified. There are definite, although not substantial, differences *in favor of females* concerning the various levels of academic performance in college. These results should be kept in mind in view of the increasing trend of a larger number of females attending college.

Motivation and Performance

The study has clearly shown that the prediction of academic performance is a very complex question. The findings reported in chapter four have demonstrated that an almost unlimited number of variables may contribute to such performance. However, there are reasons to believe that the complexities of prediction may turn out to be more apparent than real. A definite trend, that needs emphasis at this moment is one that has already been indicated, in passing, in chapter four. We found that academic performance was *negatively* related to age, to high annual income of the parents, to their educational and occupational levels, to unhappy home life, poor psychological health, low religiousness, number of hours dedicated to extracurricular activities, and a few more of the variables studied. The significant aspect, however, is that *all* these variables are *equally negatively* related to *n* Ac as measured by the TAT test. And inversely, those other personal and sociological variables which were *positively* related to performance were also positively related to *n* Ac. We can conclude with some degree of confidence that *n* Ac may summarize and reflect a great variety of other variables similarly related to academic performance. Therefore, by improving the measurement and validity of this variable we could greatly improve the prediction of academic performance. Under the next heading we will deal with these improvements in the measurement of n Ac. But if this conclusion is correct, such improvements could be of still greater relevance. By obtaining a better and more valid measurement of n Ac we could greatly simplify the problem of prediction of performance, since this variable alone includes or summarizes so many other variables similarly related to performance. Success in better isolating and measuring academic motivation may lead to a motivational variable which, together with academic potential, could contain a very high predictive value toward future college academic performance. Let us, then, turn to this important question of a better measurement of n Ac.

Major Contribution

One of the distinctive characteristics adopted in this study was the separate analysis (in relation to academic performance) that we made concerning each of the subcategories that comprise n Ac. Table 6.1 presents the correlations between n Ac, all its subcategories, and GPA at the end of first year in college. The data refer to all the students tested and to the selected sample that was reported in Table 4.6.

(See Table 6.1, page 85)

This Table demonstrates that in both samples and in both sexes, the category of Instrumental Activity (I) is the one that in every instance correlates more positively with academic performance. Very likely the subcategory I better represents, or more validly measures, academic motivation. While some other subcategories (O, Th, A+, B, IBO) at times correlate significantly beyond the .01 level (or the .05 level not shown in the Table), with the grade-point average either in

Table 6.1

Correlations between n Ac, its subcategories, and GPA for the entire and for the selected sample of freshmen

Samples	Total n Ac	I	O	IBO	Th	A+	B	N	A-	G+	G-
All Students N= 957	+.103*	+.117*	+.091*	+.111*	+.087*	+.084*	+.068	-.022	+.038	+.001	-.012
Selested St. N = 614	+.152*	+.165*	+.122*	+.159*	+.114*	+.099	+.082	+.011	+.074	+.015	-.007
All males N = 772	+.072	+.090*	+.082	+.084	+.076	+.046	+.063	-.031	+.038	-.019	-.030
Selected m. N = 459	+.139*	+.147*	+.141*	+.145*	+.117*	+.047	+.084	+.020	+.094	+.009	-.020
All girls N = 185	+.231*	+.250*	+.150	+.239*	+.134	+.221*	+.091	+.004	+.026	+.115	+.092
Selected g. N = 155	+.226*	+.276*	+.119	+.251*	+.123	+.258*	+.084	-.019	+.011	+.068	+.068

* significant beyond the .01 level of probability

all cases or in some particular sub-groups (females, selected sample, etc.), there is another number of subcategories (particularly N, G-, A-, and G+) that always correlate either negatively or nonsignificantly. These subcategories add little to, and often reduce, the predictive value of n Ac. They do not measure the same variable, or measure much less validly, academic motivation. The over-all conclusion that some particular subcategories, and especially I, are a better measure of motivation is confirmed by a totally unrelated experimental study, dealing with n Ach and belonging to an entirely different field.

McClelland (1961) obtained a representative measure of n Ach for a rather large number of modern societies by scoring the children's stories found in standard school books used by second and fourth grade students. As reported in chapter one, the correlations between the total amount of n Ach and the economic growth of those countries were positive and very significant. What interests us, however, is that he also investigated the frequency and percentage of subcategories in *n* Ach of the countries with either rapidly or slowly growing economies. His main results are summarized in Table 6.2.

Table 6.2

Differences in the *percentages* of subcategories of *n* Ach in countries with rapidly or slowly growing economies

Countries	I+	N	G±	A±	N Press	B	Th
1925 Readers Rapid Growth N = 10	*72*	9	42	31	23	*50*	46
Slow Growth N = 11	59	9	26	20	7	17	46
1950 Readers Rapid Growth N = 18	*74*	14	37	21	11	*44*	56
Slow Growth N = 21	60	13	32	35	15	33	51

(Adapted from McClelland, 1961, p. 104)

McClelland (1961, p. 103) then comments that while the percentages in the subcategories are not consistent in the two different samples, and at times (A±, Press) are actually reversed, there are two subcategories, I+ and B, that hold up significantly ($p < .01$) and consistently in the independent samples. He suggests the following interpretation:

> Psychologically speaking, what such findings seem to mean is that *n* Achievement is not only more frequently present in stories from more rapidly developing countries but when it is present, it is more apt to be *'means' oriented* rather than goal oriented. The achievement sequence *more often* dwells on obstacles to success and *specific means of overcoming* them, rather than on the goal itself, the desire for it, and the emotions surrounding attaining or failing to attain it (Cf. McClelland, 1961, p. 104; italics ours).

The reader will agree that both, our study and McClelland's, concur in the finding that stories with instrumental activity, stories means-oriented (not goal-oriented), appear to show real motivation more validly. It is not desire alone, nor the emotion or anticipation of the goal that are related to rapid economic growth (or to high academic performance), but, rather, statements that something _is being done_, that means are being used, and obstacles overcome, in the attainment of the goal. As noted in previous chapters, _activity_, either covert or overt, on the part of the characters in the stories, appears consistently as one of the best measures of a type of motivation directly related to actual behavior.

Theoretical considerations

These experimental findings suggest a shortcoming (mentioned in chapter five) that applies to all studies dealing with projective measures of human motivation. At the same time, however, they point out a possibly major contribution that may result from the present study. A very important question in the psychology of motivation refers to the relationship between fantasy and behavior: whether or not fantasy is directly related to behavior or a substitute for it. At present the answer is not clear. Fantasy is sometimes positively and sometimes negatively correlated with overt behavior (see, v.g. Skolnick, 1966, and Lazarus, 1966). As Atkinson (1961) wrote, it is important to discover: "under what conditions do the motives expressed in manifest imaginative content relate to overt behavior" (_Ibid_., p. 73). Lazarus has stated:

> What must be done is to learn _when_ the contents of story telling are _directly_ related to motivated behavior and _when_ they are _substitutively_ related (Lazarus, 1966, p. 484).

It is in this regard that some of our findings may become very relevant. The remainder of this chapter will treat more fully some of the brief considerations that were advanced in the preceding chapter. All the studies dealing with projective tests of motivation appear to have measured not the motive proper, but, rather, the concern, desire, tendency, interests, etc., that are related to some areas of behavior, such as achievement in general, or to power, affiliation, academic endeavors. There is great need to define what a motive really is, and first, theoretically, to separate this construct from similar ones such as urge, drive, emotions, attitudes, tendencies, values. Many of the conclusions and theoretical clarifications of M. Arnold (1962) may be helpful.

She defines a motive as "a want that leads to action" (Ibid, p.32) and emphasizes that activity, the decision to take the appropriate means toward the goal, the fact that we do something, that we are active and keep on striving toward the goal, is what most basically characterizes motivated behavior. From this point of view motive differs, at least frequently, from urge or drive. She writes:

> Hunger is not necessarily a motive. Hunger is an urge toward food which compels thinking about it, promotes the attempt at getting it, and is accompanied by organic sensations (hunger pangs). It does not become a motive until I decide on action. A man who is on a hunger strike is certainly hungry, but his hunger is not a motive for his refusal to eat...A motive is neither a need nor a drive nor a stimulus. It is something appraised as good for a particular action (Cf. Ibid., p. 32).

Consequently, when it is actually taken, action seems to be the best indication to infer or to measure a motive. If a person is acting toward a goal we may legitimately conclude that he has already appraised that goal as good for him. As for tendencies, they may or may not lead to action. Motive will include those tendencies that are, in truth, leading to action. A similar statement applies to emotions. "The difference between an emotion and a motive lies in the fact that an emotion may or may not lead to action, while a motive always does" (Ibid., p. 33). If value is a "desideratum" we can equally conclude that not every value is a motive. An individual may consider education valuable but have no desire to continue his own. More generally, values may indicate, not what a person wants personally, but, rather, what he thinks is good, for himself or for other people. In such contexts, values would not be motives for they are not actually leading to action. Finally, an attitude may be defined as a value that is habitually held, yet it does not necessarily include a readiness for action. There are evaluative attitudes (or habitual values) and motivating attitudes (or habitual motives); the former cannot confidently be used to predict action.

In view of these clarifications, it is apparent that the projective stories (including ours) that have been used to measure human motivation may reveal or contain motives, but many other related concepts were scored: drives, or needs (N), emotions (A+, A-), values and attitudes (G+, G-), or in general, tendencies and concern (Th, O). By scoring these emotions, attitudes, or tendencies, many of them containing merely evaluative, rather than motivating, ideas or concerns, and by failing to distinguish between the two, we have measured other things besides motives. This is why the relationship between the imaginative content of the stories and overt behavior has been found to be so inconsistent: sometimes positive, and sometimes negative. That these considerations are not purely theoretical, and the inference drawn not illegitimate, has been supported by the results presented in Tables 6.1 and 6.2. The finding that Instrumental Activity in the imaginative content is the subcategory most directly related to actual behavior and academic performance, helps us to realize more clearly under what conditions the contents of story telling can be most directly related to motivated behavior.

New Scoring Manual

We intend to continue the present investigation and to give the same test for *n* Ac to two groups of students (about 150 boys and 100 girls) taken from the same class we tested during their freshman year. Their stories will be scored according to the Manual included in Appendix II, as well as according to a new Manual for scoring *n* Ac to be constructed in accordance with the theory and findings just discussed. In this new Manual many innovations will be introduced, some of the most important being the following:

1. Academic motivation will be defined as "something (a want, a value, a concern) that prompts (the characters in the story) to *academic action*." If the stories contain academic instrumental *activity* (reading, studying, trying to solve scholastic problems or questions, striving to do well in examinations or in the academic professions) the stories will be scored for *n* Ac. Only then, will the presence of other subcategories be scored. If no kind of academic activity is present, the scoring will be either Doubtful or Unrelated, depending on the degree of certainty with regard to the absence of academic activities.

2. Since activity, even in fantasy, appears to be the best sign of motivation, it will be scored *as many times* as different types of activity are found in the stories; instead of only once as in the former method. We were never convinced of the accuracy of the theoretical reasoning that subcategories should only be scored one time per story.

3. All other subcategories (N, G, A, O, B, Th) will be scored *if* they lead to, or result from, academic actions, and, similarly, as many times as they appear. For instance, this sentence: "A boy *wants* to be a doctor, he is *dreaming* about becoming a surgeon" can only be scored as doubtful, for nothing is said about academic activities. This other

sentence: "This boy is studying very hard for he wants to become a doctor," will be scored as containing *n* Ac, and the subcategories of I and N. His wanting to become a doctor leads or impels him to study hard.

4. Four of the subcategories (G±,A±, B±, O±) will be scored both as positive and negative if they so appear in the stories. The rationale for the distinction is that by analyzing both types of each subcategory, we might discriminate between motivation of hope for success and motivation of fear of failure. The subcategory of Blocks, does not need to be subdivided into Bp and Bw since the value of this subdivision is doubtful and blocks will be scored as many times as they appear in relation to academic activities.

We are confident that these innovations might prove to be real improvements but, obviously, experimental research is needed in order to confirm this confidence. We also intend to analyze, in particular, whether or not the innovation of scoring each subcategory many times proves to be significant or irrelevant. In addition, a correction factor for the length of the stories will be used since verbal fluency might become highly rewarded in this method of scoring.

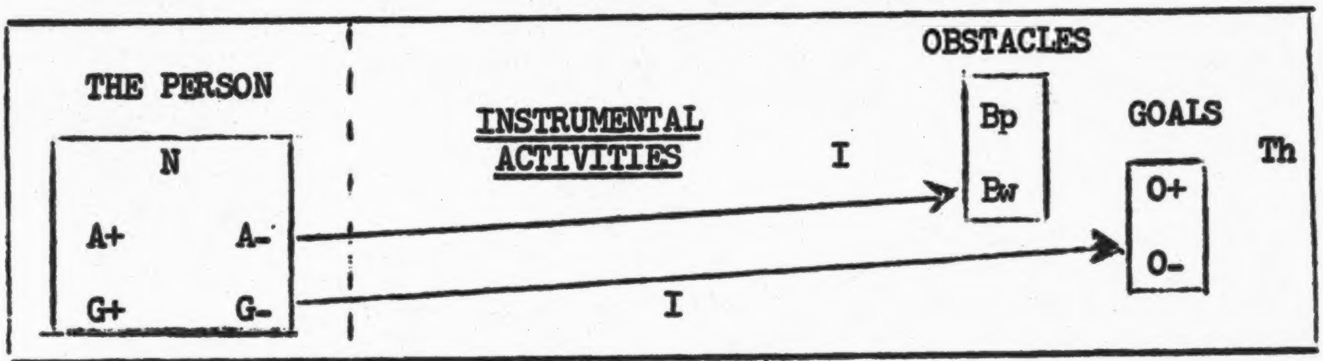
Final considerations

The popular method for measuring human motivation introduced by McClelland and his associates (1953) has proven to be very useful and has made an enormous contribution in the field of human motivation. It is the result of empirical studies and in the future might still remain as more valid than the new method we are suggesting. However, from theoretical and experimental points of view it leaves much to be desired in the light of the findings reported in this study and in previous investigations. We may add that McClelland *et al.*, (in

Atkinson, 1958, p. 180) proposed the following diagram for representing their conceptualization of the scoring categories in the motivational sequence (Fig. 6.1).

Figure 6.1

Conceptualization of the scoring categories
and the motivational sequence



(Adapted from Atkinson, 1958, p. 180)

These subcategories are scored in their method,(plus Nurturant Press not shown in the diagram; the O categories have been added). All subcategories are given equal theoretical value. In fact, however, A and G, proven to be less valid (see Table 6.2), can be scored twice (A+ and -), and may contribute more to the total score than I, which in McClelland's method can only be scored once (either +, ?, or -). Furthermore, it is not difficult to realize that all subcategories under the heading, "the person" can be evaluating emotions, or tendencies, attitudes, or concern, not exclusively motivating. We believe that the lines in the center of the diagram between the person and goals and obstacles, the Instrumental Activities, more truly represent the essential characteristic of the motive. A recent doctoral dissertation by L. Ramallo (Harvard University, 1966), entitled Subject, Object, and Human Action: An enquiry into Existential Pragmatism, proves, from a philosophical and experimental standpoint, that action should be integrated in the context of both subject and object and that the errors of many psychological studies are rooted in the prevalent tendency to investigate object and subject, separately from one another, and from action. Ramallo comments:

> Human action, then, in this view, is not understandable *outside* of a context of *integrated* object and subject, simply because it cannot happen outside of this context (1966, p. iv).

The broken line that we have added to the diagram aims at emphasizing this point. By measuring human motivation (that is, human action) when *only* those categories either within the person or within the environment are present, we measure it outside of a context of *integrated* object and subject and are running the risk of either emphasizing subjectivism,(personal and subjective aspects) or objectivism (if only Blocks or Outcome are scored). Instead of measuring human action we may be measuring a *substitute* for it. We need a method that considers, not the person or the world, separately, but *the-person-in-the-world*, the *integration* between object and subject, between the individual and his goal: activities of the person toward the goal may be the answer we all have been looking for.

Further Advantages

By retesting the same students and scoring their stories to the same pictures a second time by the previous and by the new method of scoring, many additional advantages may result. A very brief enumeration will suffice: (1) most of the limitations discussed in chapter five will be avoided or greatly diminished; (2) by comparing the stories of the same students to the same pictures, scored with the same method, but written three years later, we can investigate not the scorer's reliability but the reliability of *n* Ac as we measured it for this study; (3) the new method of scoring can be contrasted with the previous one in order to determine whether or not the innovations proposed are real improvements, and whether or not the new scores not only better predict future academic performance but would have better predicted past academic performance had this scoring been used in the stories of the first week in college; (4) the possible changes in motivation by comparing the amount of n Ac three years later, can also be investigated; (5) finally, in addition to other objectives, such as the experimental re-analysis of most of the findings reported in preceding chapters, we could begin to consider practical and feasible ways of influencing this type of motivation if the new method is proven to be valid and theoretically correct.

It is mainly because of the positive contributions discussed in this chapter, and the new light obtained on what is or may be the essence of motivated behavior, that we consider we have been very successful in this investigation on academic motivation and on the numerous variables that contribute to it and to the prediction of academic performance. Our findings have been not only positive and significant, they have also revealed new and better ways for measuring academic motivation, and have afforded a solid basis to determine under what conditions the imaginative content of the stories can be either positively or negatively related to overt behavior.

CHAPTER SEVEN

SUMMARY AND CONCLUSIONS

General Findings

In this final chapter we have brought together our main findings and conclusions in order to present a summary or overview of what this investigation has achieved concerning the relationships between measures of academic motivation and academic performance in college. By so doing it is expected that there will be obtained a more comprehensive and structured perspective of the many data reported in all the preceding chapters, together with a better view of the various ideas, suggestions and possible improvements that have been advanced with regard to future research in the field of academic motivation.

1. A new motivational variable, the need for academic achievement, (n Ac), has been measured by using a projective test and by means of a method of scoring especially prepared for studying this particular variable. We have shown that n Ac can be reliably scored and that it is positively and significantly related to academic performance in college. This relationship holds true for both male and female students. N Ac is also positively related to other "motivational" variables such as number of hours of study per week, grade-point average in high school, ratings by others concerning the students' motivation and their academic achievements.

2. This variable, n Ac, discriminates significantly high achievers from low achievers even when ability (or academic potential as measured by the CEEB scores) and performance in college (represented by the GPA) are controlled or held constant (see Tables 4.2 and 4.3). It also correlates more positively with the grades of the second than of the first

semester in college. One of the subcategories that comprise n Ac, Instrumental Activity (I), was found to be more consistently and more directly related to overt behavior, that is, to academic performance during the first year in college.

3. All these findings and positive correlations are always higher and more significant for female than for male students. It is also suggestive that in females n Ac correlates positively with academic potential (CEEB scores) while in males it correlates negatively. The reasons for this and for many other differences among the sexes are complex and far from clear. In pages 59-64 of chapter 4 an attempt was made to offer some probable explanations for the differences between men and women in the area of academic performance.

4. As has been reported in other investigations, this one has also found that the best predictor of future performance in college is past performance in high school. This finding is perhaps not very surprising since academic performance appears to be a very complex variable to which many factors contribute (personal, sociological, intellective, non-intellective). The high school GPA,or rank, probably summarizes and contains most of these contributing variables.

5. Although positive and significant, the correlations reported, have not been substantial, due in part to the limitations in the criterion used to measure academic performance in college, to the method employed for scoring n Ac, and to many other shortcomings which have been explained in some detail in chapter five.

6. Although our main interest has focused on motivational variables, a great number of other variables has been studied and previous findings by other investigators have been either confirmed or clarified. It has become very apparent that academic potential, or intelligence,

is not the most decisive factor in the prediction of success in college. In line with other investigations, this one re-emphasizes that a great variety and complexity of non-intellective variables contribute to academic performance in college, probably more so than during the grammar or high school years. This last probability needs further study and research.

7. A significant contribution of the findings presented may be the similar correlations obtained between n Ac and other numerous variables, from varying sources, which are also related to academic performance in college. More concretely, such variables as religiousness, ratings by others, annual income of parents, psychological health, hours of extracurricular activities, amount of study per week, happy or unhappy home life, and many others, have been found to be related to future academic performance and also are similarly related to academic motivation as we have measured it. It seems, then, that n Ac may be a summary of systematic variations in other variables, and therefore, improvements in the measurement of n Ac could contribute greatly to improvements in the prediction of academic performance. This being so, academic motivation, as revealed in the TAT test, if better measured by means of improved methods, may develop to be one of the best predictors of achievement in college.

Other contributions

1. A distinctive and novel characteristic of this investigation, besides the specific study of n Ac (which is probably one of the many dimensions included in the multidimensional construct of need for achievement or n Ach), has been the particular and separate analysis, in their relation to academic performance, of all and each of the subcategories that contribute to the total n Ac score. A variety of

findings has resulted from this analysis. Some of them deserve special consideration.

2. A great number of studies dealing with motivational imagery and actual behavior have reported that although both, thoughts and actions, are, as a whole, significantly interrelated, this mutual relationship is very complex and not always a direct one. Not infrequently the studies have shown inverse relationships, as if fantasy were a substitute rather than a predecessor for action. It is imperative to define what particular conditions, and what aspects of the so called "motivational" imagery, will show correlations between thoughts and actions that will be either positive, negative or non-existent. Some light has been shed in this direction by showing what subcategories, among those used in scoring n Ac, correlate with actual performance in positive or negative ways. Although total n Ac is directly related to performance, some subcategories have been found to be either negatively or nonsignificantly related to it. As a result, in the future we can be more confident of obtaining better correlations between "fantasy" and behavior since we now posses a better knowledge of those aspects of the "motivational" content of imaginative stories that are more directly or less directly related to behavior.

3. This analysis of all the subcategories included in n Ac has also contributed greatly to a better understanding of what a motive really is. Experimental findings and theoretical considerations concur to the conclusion that a motive should be defined as "something that prompts to act." Activity, striving toward the goal, actual use of means, appear to be essential characteristics of motivated behavior. The data support the inference that activities taken by the characters in the stories, either mental or overt, will reveal much better those

categories which are most basically "motivational." If this conclusion is confirmed by further experimental studies, we may have obtained a possible breakthrough toward the measurement of human motives by means of imaginative stories.

4. The findings appear to have demonstrated the reason for many of the inconsistencies found in similar investigations of human motives dealing with projective tests. What has been scored by means of the current methods are not motives proper, but values, attitudes, tendencies, needs, concerns, and similar concepts or constructs. All of them may or may not be motivating, that is, may or may not prompt to action, and therefore, will not always be directly related to behavior. This aspect has been confirmed by us and by other studies: in general, the correlations between "thoughts" and behavior have not been consistent and substantial, sometimes they were positive, sometimes negative or insignificant. Such variations were to be expected if concern or tendency, rather than motives, were being measured; that is, if aspects of the content in the stories that did not include activity or were not prompting the characters to act were also being scored.

5. A final contribution of the study, related to the one just mentioned, is the new ways that have been suggested for scoring real "motivational" content. Any want, any tendency, any concern that prompts to action will be motivational and in all likelihood directly related to actual behavior. Similarly, emotions and attitudes that *result* from overt or covert activities will probably be more closely related to motivation or behavior than those attitudes and emotions which in the stories do not lead to, or have not resulted from, any activities. Future methods for scoring motivational variables should be based on instrumental activities as the key concept which will determine the

presence or absence of such motivation. It is also probable that activities should be scored, not once, but as many times as they appear in the stories.

Future Investigations

1. All the contributions alluded to cannot be considered as established until further research has proven their validity. Some subsamples should now be taken from the students tested in this investigation in order to be re-tested, and the stories obtained, based on the same pictures, re-scored by using the new method that has been explained. By so doing, most of the limitations pointed out in chapter five could be avoided and the validity of the contributions discussed could be properly investigated. There is also need to analyze possible changes in motivation throughout the years in college, and the reliability of n Ac as measured by the same TAT test but given some years later.

2. More importantly, we believe that psychological studies should be constructive and lead to practical applications. It is not of much real value to merely be aware of the fact that some students are more academically motivated than others. This could also be known from their grades in college or by studying their contributions in later life, while engaged in their academic professions. We are more concerned with positive psychological studies that help to better develop individual potentialities, that contribute to improvements in students and future citizens. If n Ac is a relevant motivational variable, if those individuals with higher academic potential are, in fact, lower in academic motivation, as suggested by the findings reported, it is imperative to find ways and methods to influence and increase this variable in those individuals who are low or very deficient in it, and

who, because of their many potentialities and abilities, could more creatively contribute to academic endeavors if their degree of motivation were efficiently increased.

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APPENDICES

Appendix one: Test of Imagination

Appendix two: Scoring Manual for the Academic Achievement Motive

Appendix three: Freshman Survey

APPENDIX ONE

TEST OF IMAGINATION

Name.. Today's date............
(last) (first) (middle)

Age: Years.......... Months.......... School............ Major...............

PLEASE READ THE FOLLOWING DIRECTIONS CAREFULLY. DO NOT TURN PAGE UNTIL INSTRUCTED TO DO SO BY THE EXAMINER.

This test gives you an opportunity to use your imagination, to show how you can create ideas and situations by yourself. In other words, instead of presenting you with answers already made up, from which you have to pick one, it gives you the chance to show how you can think things up on your own.

The following pages present a series of pictures and your task is to write some brief stories that are suggested to you by each picture. Try to imagine what is going on in the picture. Then tell what the situation is, what led up to the situation, what people are thinking and feeling, and what they will do. In other words, write as complete a story as you can, a story with plot and characters.

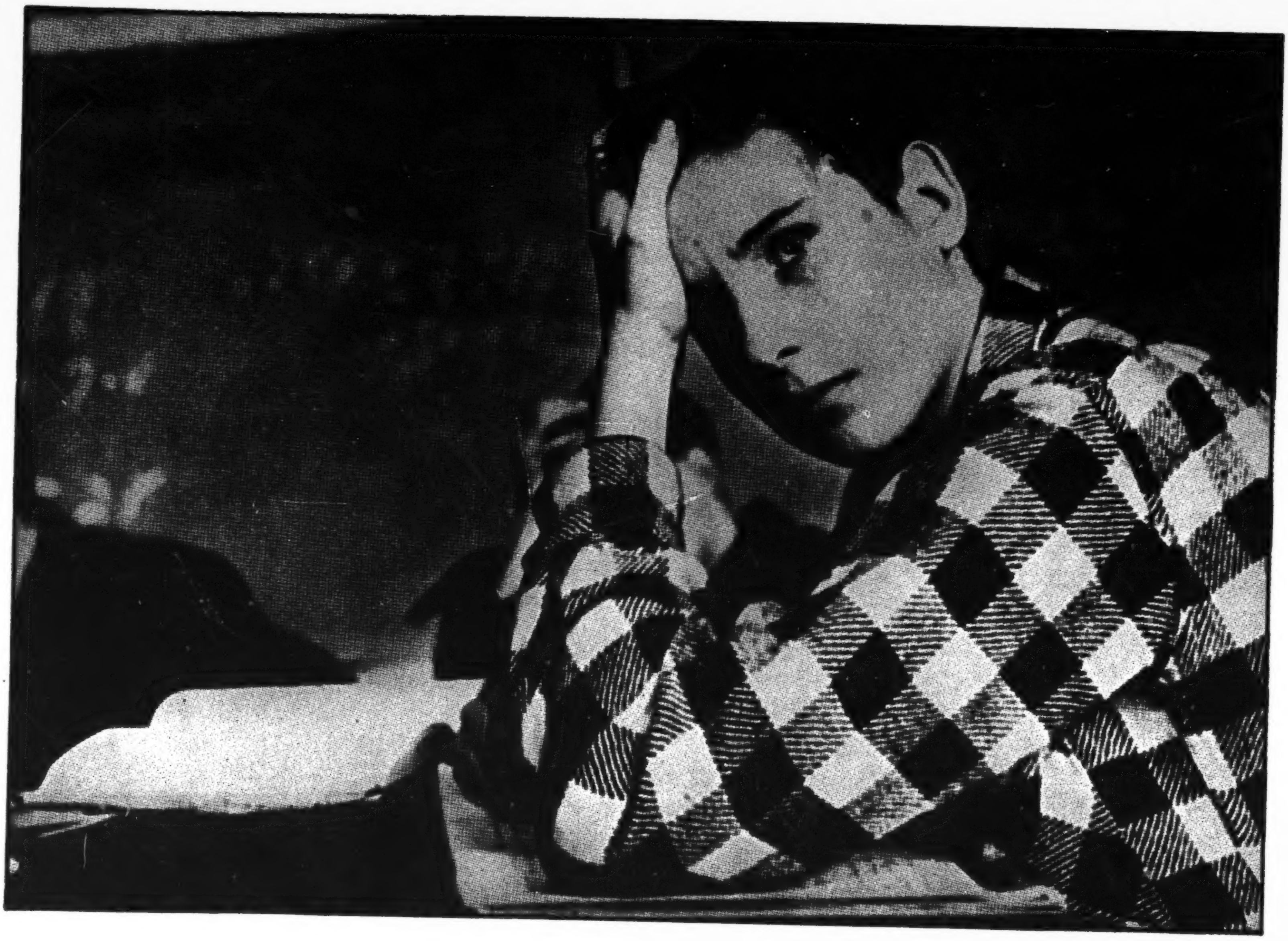
You will have a few seconds to look at each picture and then 5 minutes to write your story. Write your first impressions and work rapidly. The examiner will keep time and tell you when to finish your story and get ready for the next picture. There are no right or wrong answers in your stories, so you may feel free to write whatever story is suggested to you when you look at a picture. Spelling, punctuation, and grammar are not important. What is important is to write out as fully and quickly as possible the story that comes into your mind as you imagine what might be going on in each picture. You will notice that there is one page for writing each story. Should you need more writing space for any story, you may use the reverse side of that page.

To help you cover all the elements of a story plot in the time allowed, you will find the following questions spaced out over each of the pages:

1. What is happening? Who are the people?
2. What has led up to this situation? That is, what has happened in the past?
3. What is being thought? What is wanted? By whom? How are they feeling?
4. What will happen? What will be the outcome?

Plan to spend only about a minute on each of these questions, but keep in mind that the questions are only guides for your thinking and need not be answered specifically in so many words. That is, the story should be continuous, not a set of answers to questions. The pictures are purposely vague and suggestive of many things. Do not try to figure out exactly what is going on in them. Do not describe them. But try to make your stories long, interesting and dramatic. Any kind of story is all right. Show that you have an understanding of human nature and can make up stories about people and human relationships.

If you have read these instructions carefully and understood them, wait until the signal is given and then turn the page, look at the first picture briefly, write the story suggested to you in the following page and so on through the booklet. There will be six pictures in all. You will be allowed approximately thirty (30) minutes for the entire test.



JUST LOOK AT THE PICTURE BRIEFLY (10–15 SECONDS), TURN THE PAGE AND WRITE OUT THE STORY IT SUGGESTS TO YOU.

WORK RAPIDLY. YOU HAVE FIVE (5) MINUTES FOR THIS STORY

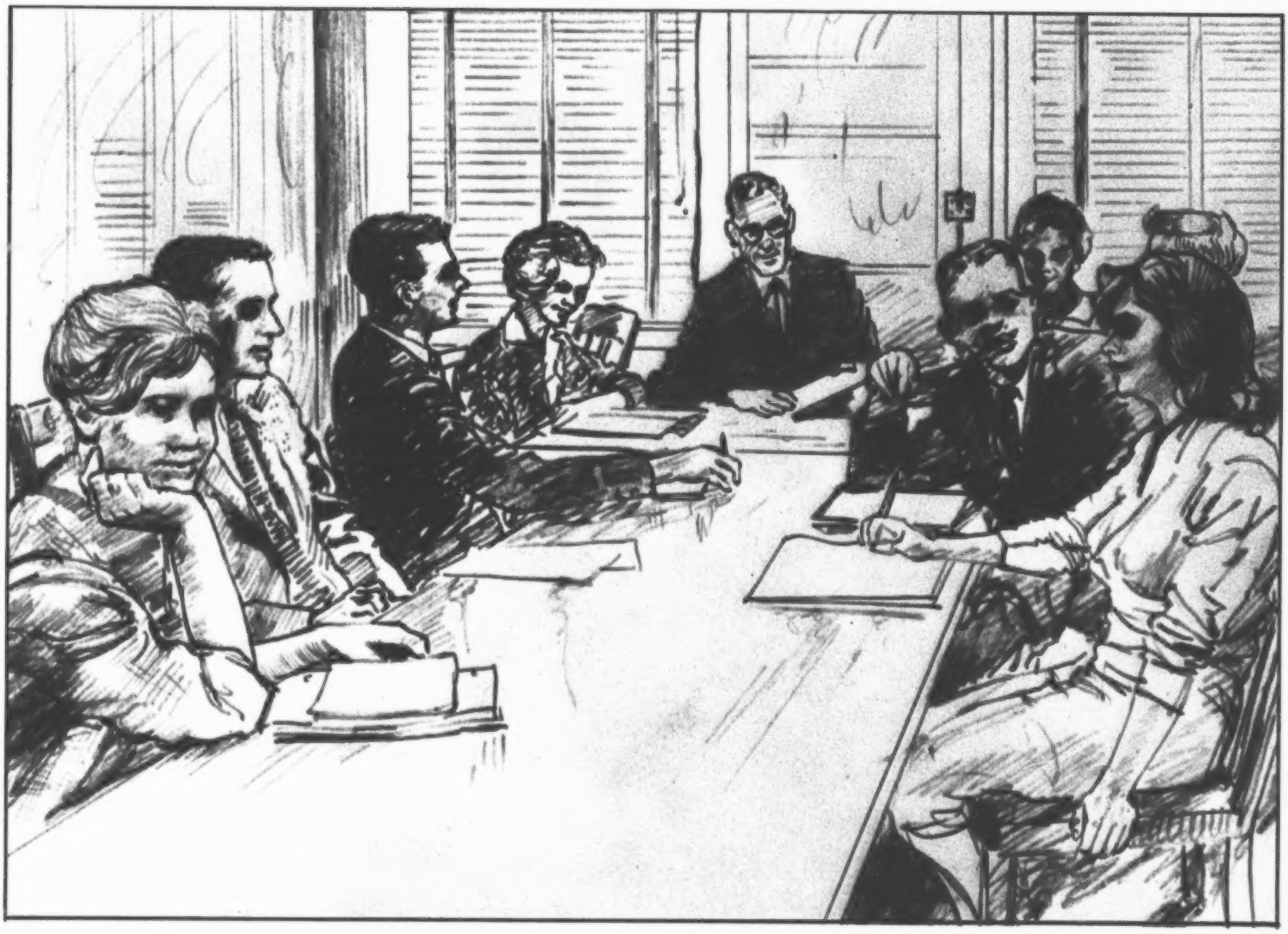
1. What is happening? Who are the people?

2. What has led up to this situation? That is, what has happened in the past?

3. What is being thought? What is wanted? By whom? How are they feeling?

4. What will happen? What will be the outcome?

NOTE: If you have not finished and time is called, you may return at the end of the test to complete this story.



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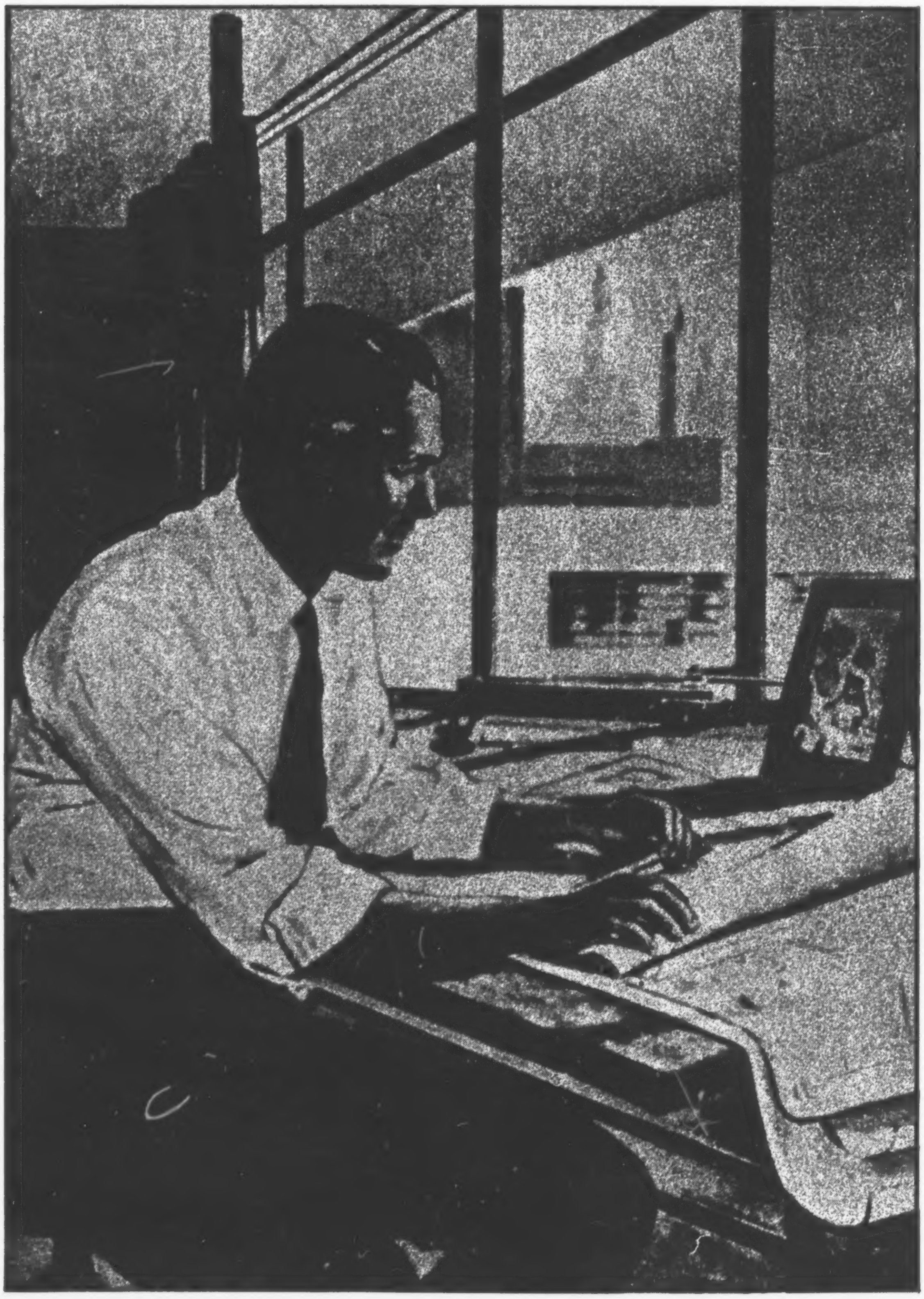

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4. What will happen? What will be the outcome?

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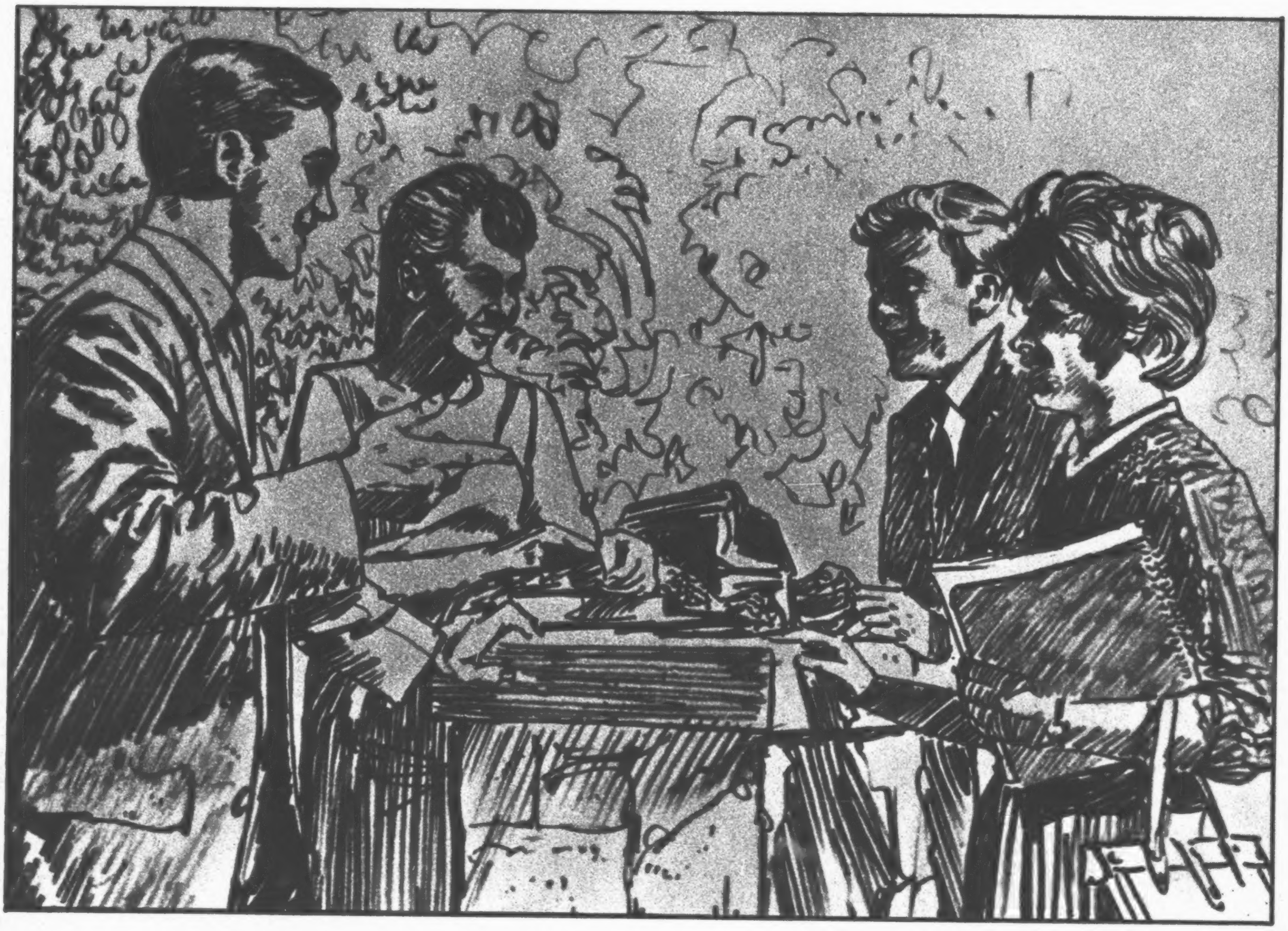

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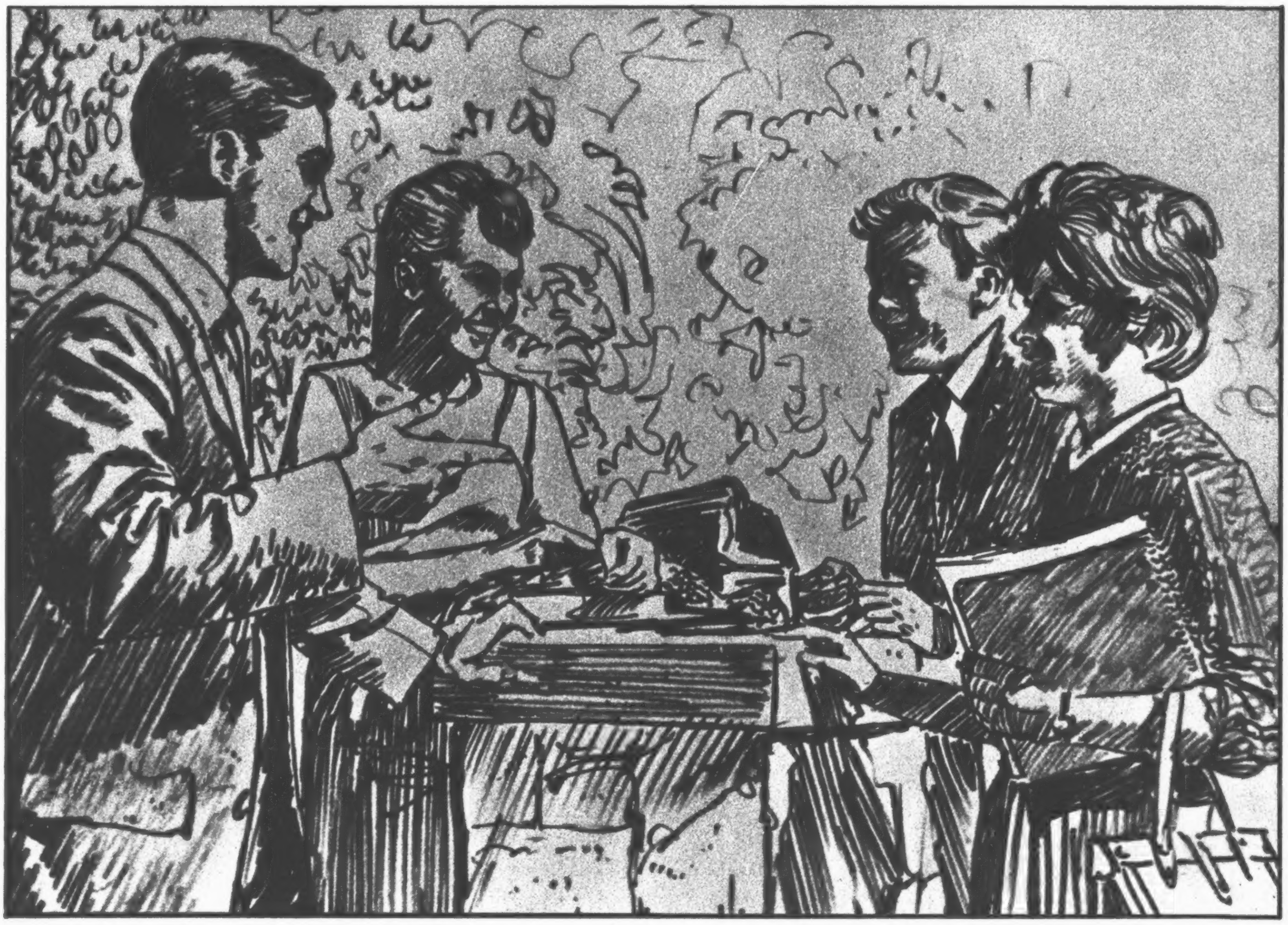

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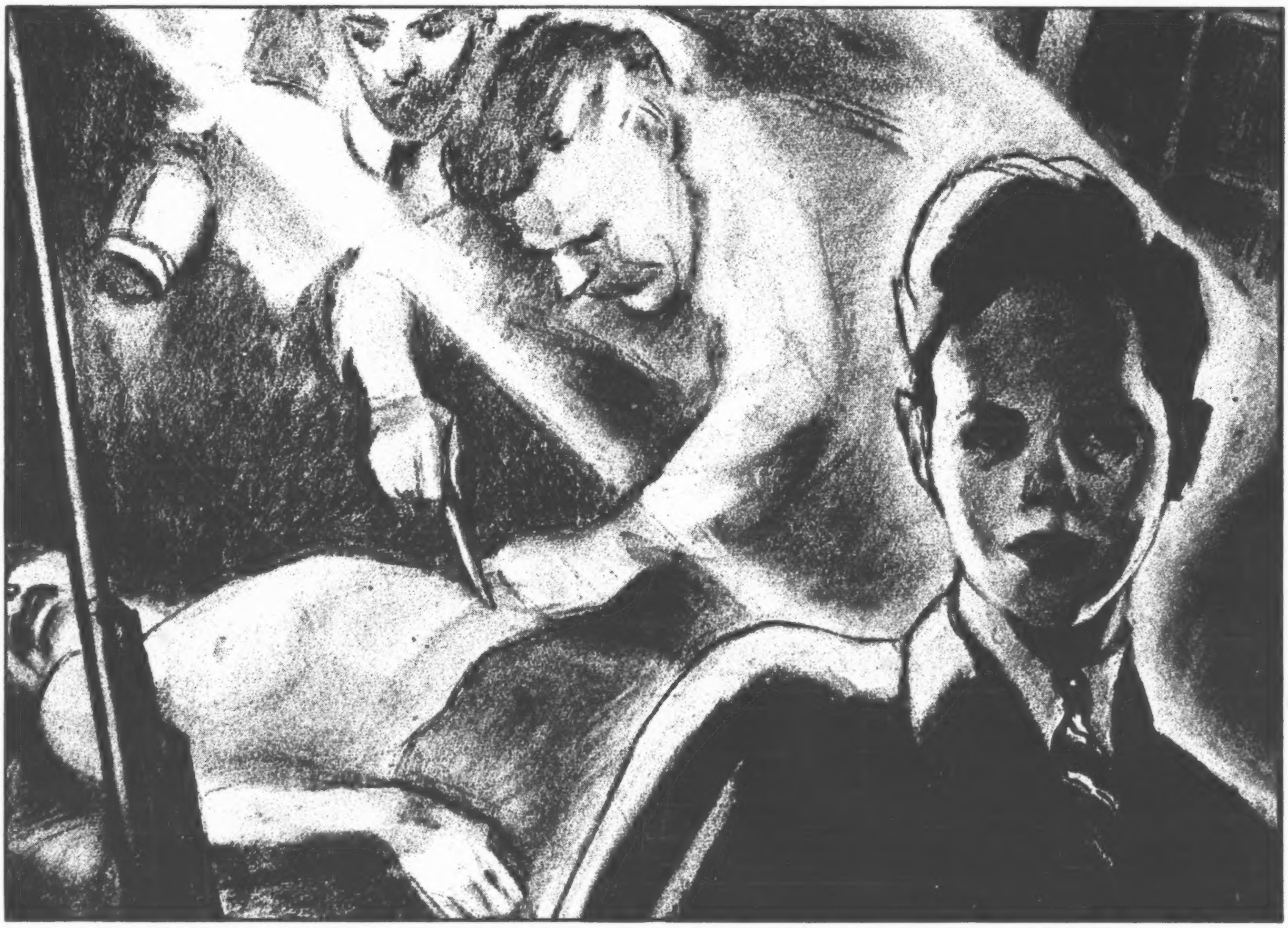

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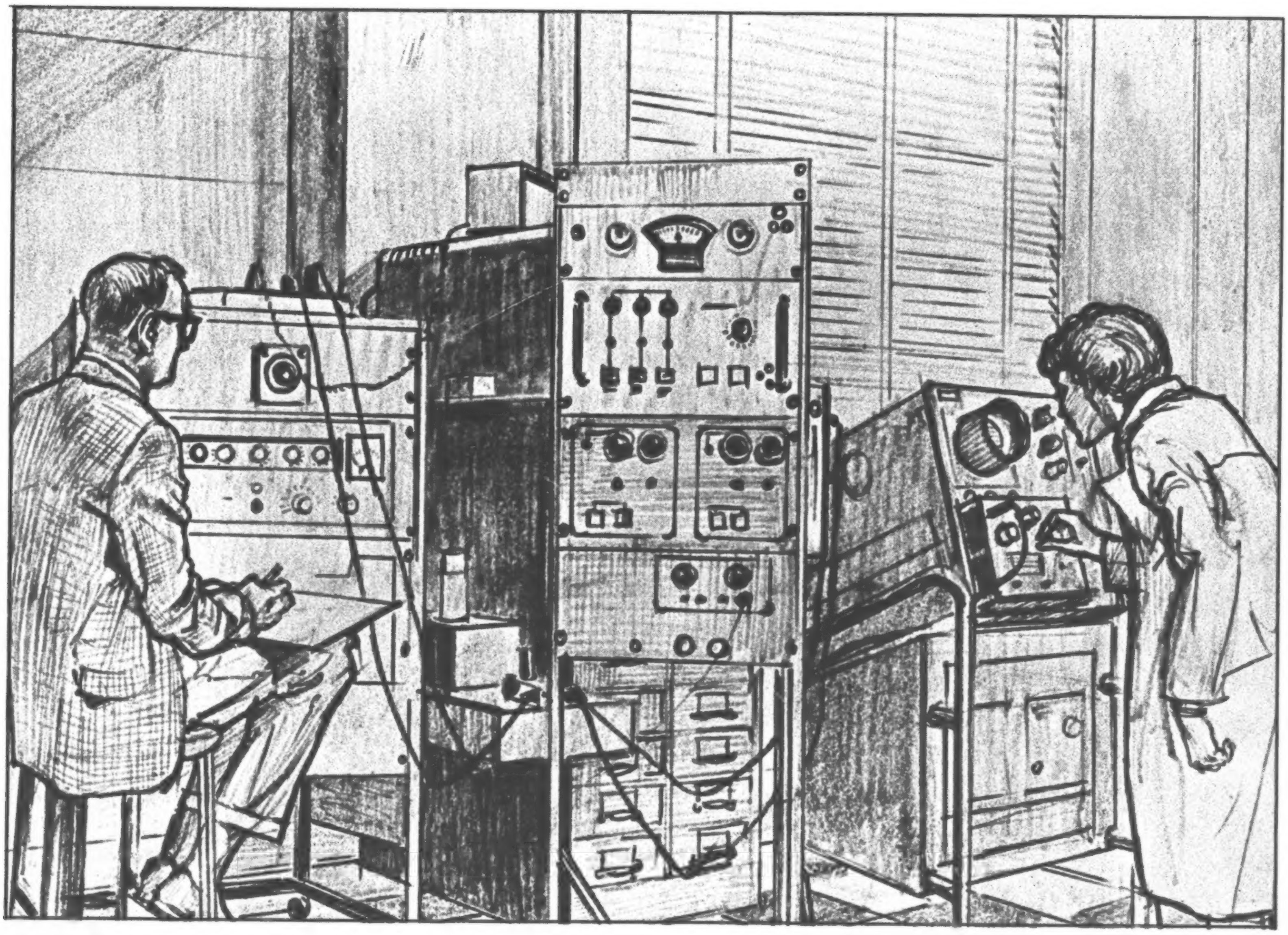

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4. What will happen? What will be the outcome?

NOTE: If you have not finished and time is called, you may return at the end of the test to complete this story.

APPENDIX TWO

MANUAL FOR SCORING

THE NEED FOR ACADEMIC ACHIEVEMENT

SCORING MANUAL FOR THE ACADEMIC ACHIEVEMENT MOTIVE

Academic Achievement

This Manual is based on those for scoring Need for Achievement, Need for Affiliation and Need for Power, published by J.W. Atkinson (ed.) in his book: Motives in Fantasy, Action and Society (Princeton, N.J.: Van Nostrand, 1958, pp. 179-233, 685-818). Most of the material and illustrative stories will be taken mainly from the "Manual for Achievement Motive" (Ibid., pp. 179-204). However, this is a revision of that Manual as applied to a more specific motive: Academic Achievement (n Ac). It may be assumed that all instances of Academic Motivation are instances of Need for Achievement (n Ach) in general, but not vice versa. Our definition will limit the instances in which Academic Imagery will be scored. Another change to be introduced is the following: among the subcategories of Achievement Imagery, Instrumental Activity (I) is scored as positive, negative or doubtful. This has proven of not much practical use and will be dropped. The presence of Instrumental Activity will be scored regardless of whether it is positive, doubtful or negative. Nurturant Press, another subcategory of Need for Achievement will also be dropped. If a boy, for instance, asks his teacher or a classmate to help him in solving his academic problems, this will be scored as Instrumental Activity, but it will not be included in a special category.

Nevertheless, an important category not found in the Manual for n Ach will be introduced: that of the Outcome (O). Studies of this aspect, for instance, that of Magda Arnold (Story Sequence Analysis) have proven that this may be an important variable. The questions in the stories ask specifically for such outcome, and it is felt that it has many potentialities, and that probably it will discriminate Academic Motivation with hope for success from Academic Motivation with fear of failure. In addition, *Instrumental Activity*, is positive or negative as a result of the outcome, and by scoring this subcategory we will be giving some consideration to the varieties of I that have been dropped. All other categories of the Manual for Need for Achievement will be retained. Let us now describe them in detail.

DEFINITION OF ACADEMIC MOTIVATION

Need for Achievement is defined as "competition with some standard of excellence," or "desire to do things well." Similarly, Academic Motivation is defined as "competition with some standard of academic excellence" or "concern over academic accomplishments" or "desire to do well either at school or at the academic professions," "tendency to strive for success in academic situations." It may also be defined as a want or desire which leads to academic *action*. This desire should be either *explicitly* stated in the stories or at least *implicitly* contained. Since no subcategories may be scored unless a clear instance of Academic Imagery is present, it is all-important to describe in some detail the criteria for scoring or not scoring Academic Imagery. The following are the most important criteria.

1. *Competition with a standard of academic excellence*.

a) *Explicitly*. One of the characters in the story is engaged in some competitive activity of an academic type, where winning or doing as well as or better than others is *actually stated* as the primary concern. Wanting to win an essay contest, to get an excellent grade in the exam, to graduate at the top of the class are typical examples.

b) *Implicitly*. (1) When one of the characters of the story is engaged in some academic *activity* but the desire to win or do as well as or better than others is not explicit but may be *inferred* clearly either 1) from strong affective concern over academic achievement or 2) from certain types of *Instrumental Activity* which indicate that the desire to achieve and excel academically is there. Typical examples are: "The boy makes a good exam and *feels proud*." "The boy is studying very *intensely* and *carefully*." It must be noted that the stories should not be scored for AI (Academic Imagery) when the evidence of affective concern is largely negative. There must be *independent evidence* of a *positive* academic orientation either by hopeful *anticipation* ("He is thinking of the glory he will obtain if he graduates") by a clear-cut *need* ("He wants to do well) or by a definite *instrumental* act ("He is doing his best"). The following story is an excellent example of what NOT to score:

> The young student seems to be *perplexed* with some problem and then finding no solution appears to daydream. The young student was asked a question about which he did not know the answer, so he felt rather *discouraged* and *disgusted*. The student is *wondering* whether school work is necessary "stuff" or not. He hopes he were doing something else. He will continue in school, perhaps graduate; if not, he will soon quit school and look for adventure elsewhere, perhaps in a trade school.

The following is a story with Academic Imagery (implicit):

> Peter is in class and he has to write a quiz. The day before, Peter instead of studying for the quiz went to the movies with some friends. Peter thinks now how *foolish* it was to go to the movies. *He wants now to know the answers for the quiz*. Peter will have a poor grade in his quiz and *should work harder to* make up his grade.

(2) Often the standard of academic excellence involves no competition with others but rather that of meeting *self-imposed* requirements of good performance. In this case, in order to score AI what is needed are words to the effect that a good, thorough job is desired, or state-

ments showing the affective concern or Instrumental Activity that will allow such an inference. Adjectives of degree (good, better, best) are typical here. Examples: "The boy is studiously preparing his homework," "he wants to do well." It must be noted that the adjectives used should show concern over academic accomplishment. For instance, to work hard or fast "to finish his homework" may indicate only that he wants to go out and play or perhaps that he is late with his term paper and is rushing to get it in. On the whole, also, a clear distinction should be made between working because he has to, he is forced from the outside to, or because he wants to, he hopes to. The former are not clear examples of Academic Imagery.

2. Unique Accomplishment. One of the characters is involved in accomplishing other than routine daily tasks at school or college, or academic professions. Inventions, new methods of surgery, artistic creations, an excellent and original paper or essay, and other extraordinary accomplishments in the academic field fulfill this criterion. Here we may make the inference that the individual is competing with a standard of academic excellence. The scorer should be sensitive to what would constitute a unique accomplishment in the academic field. The following is a good example:

> This chap is doing some heavy medidating. He is a sophomore and has reached an intellectual crisis. He cannot make up his mind. He is troubled, worried. He is trying to reconcile the philosophies of Descartes and Thomas Aquinas -- at his tender age of 18. He has read several books on philosophy and feels the weight of the world on his shoulders. He wants to present a clear-cut synthesis of these two conflicting philosophies, to satisfy his ego and to gain academic recognition from his professor. He will screw himself up royally. Too inexperienced and uninformed, he has tackled too great a problem. He will give up in despair, go down to the G- and drown his sorrows in a bucket of beer.

3. Long-term involvement. The last criterion for scoring AI is where one of the characters of the story is involved in attainment of a long-term academic goal. Being a doctor, lawyer, engineer, a successful professional, etc., are all examples of career involvement which permit the inference of competition with a standard of academic excellence, UNLESS it is made explicit that another goal is primary and exclusive. If other motives are contributing, such as food for the family or wish to satisfy the parents, but are not exclusive so that SOME PART of the striving is attributable to Academic motivation, AI should be scored. For instance, studying for an exam would not be scored unless there is clear evidence of concern over doing well or of going on to medical school or graduating from college -- both being long-term academic achievement goals. The relationship of a specific task to a long-term involvement goal must be clearly stated. It is worth noting that we are able to include long-term involvement as evidence of academic motivation because we have knowledge that in contemporary American society, success in the career usually demands competition with a standard of academic excellence. Not everyone can be a doctor, a professor, a lawyer or a successful politician.

Only stories that fulfill at least one of these three criteria are scored for the subsequent academic achievement-related subcategories. The same phrase may be scored for AI and any other subcategory, but the same phrase may not be scored for two subcategories.

Illustrative Examples

1. *Competition with a standard of ac. excellence.* a) *Explicit.* A student in a classroom is listening to a teacher explain the contents of a book which lies before the student. He is *very interested* in the subject. He has passed through all preceding school years, and is an intelligent boy. He entered the classroom with his fellows and is now listening to the teacher. He is *trying to understand* the subject which is new to him. The teacher also is *trying his best* to make students understand. The student will understand the subject and will go out of the class *happy* about his success in grasping it. He always *wanted to do his best* and will be a success in life.

The boy is taking an hour written test. He and the others are high school students. The test is about two thirds over and he is *doing his best* to think it through. He was supposed to study for the test and did so. But because it is factual there were some items he saw but did not learn. He knows he has studied the answers he can't remember and is trying to summon up the images and related ideas to remind him of them. He may remember one or two but he will miss most of the items he can't remember. He will try hard until five minutes are left, then give up, go back over his paper, and be disgusted for reading but not learning the answers.

b) *Implicit (1).* Jim Doakes is taking his final exam in economics, and has reached a problem needing quite a bit of thought. The other problems were rather simple for Jim, but this one is the toughest one of the whole exam. He is *trying to work it out* logically in his mind. What is the answer to the problem? Oh yes, *I have it now!* But wait a minute! I am missing something yet. Jim will work out his problem in his mind and will continue with his economics exam without too much difficulty.

Implicit (2). The student, Peter, is flunking a physics exam which is very important to get into dental school. He fooled around at the beginning of the semester and got two E's on tests and has since studied rather... He is *frightfully* afraid as he *wants an A* to balance the E's His mind is thus confused as he can't understand the problems. He fears that he will fail. By a stroke of luck, the class average is very low and Peter gets a B. He is thus *encouraged* and *fights bravely* on to get a B at the end of the semester.

2. *Unique accomplishment.* This brings to mind Thomas Edison who is dreaming of possible inventions rather than turning to his studies. A poor student, Edison is probably worried about his future. Probably he is doing poorly in school or is thinking of his girl or perhaps he is being reprimanded by the teacher for inferior work. I think he is dreaming of some childhood *invention* that he would much rather be working on than studying the boring subjects of grammar school. He is destined to become one of the greatest of American inventors, devoting his entire life to things such as the light bulb, the phonograph.

3. *Long-term involvement.* The young boy is imagining himself a great physician. In background are the Drs. M and X, carrying the torch of modern sterilized medicine. The young lad has been inspired by some-

thing he has seen or read, and wants very much to be a doctor. He will leave his brown study, return to it eventually and apply to college for admission.

DOUBTFUL ACADEMIC IMAGERY (DI)

Stories containing some references to academic achievement but which fail to meet one of the three criteria for academic imagery are scored Doubtful Academic Imagery and are not scored further for academic related subcategories. Whenever there is doubt about whether or not one of the three criteria for academic imagery has been met, and the story is not totally unrelated to academic achievement, it is classified DI. Usually the stories most frequently to be classified as doubtful are those in which one of the characters is engaged in a routine study situation or when he is working fast in order to do other things not related to academic achievement or the character studies because he has to, is forced to, but would rather be doing something else, or when the affective concern is largely negative.

Illustrative Example

Jim is in the midst of deep thought trying to pick the answer to a problem of his exam out of the thin air. He is evidently having a difficult time with it. Jim probably didn't prepare himself too well for his exam and therefore does not have necessary things at his finger tips. Jim is trying to remember some formula. If he could just remember it, he could solve his problem immediately. Jim will skip to the next problem in a short while and then return to this one. (Note that there is no evidence of concern over the outcome of this academic situation. There is no stated need to do well, of working carefully, or of affective involvement, etc.).

UNRELATED IMAGERY (UI)

Stories in which there is no reference to an academic goal are classified as Unrelated and not scored further. In these stories, in contrast to the doubtful ones, there is no reference whatsoever to either academic achievement or an academic situation.

The imagery categories (AI, DI and UI) comprise a continuum of increasing certainty that the story contains imagery related to academic motivation. Often the scorer may feel that a story which by strictly following the norms must be scored DI (because it fails to meet any of the criteria for AI), should have been scored for AI and the other subcategories as well due to other factors that feelings or intuitions might detect. However, experience indicates that, while undoubtedly some academically motivated stories are lost by being faithful to the stated criteria, in the long run, rigid adherence to these criteria is the only means of assuring high scorer reliability.

Illustrative Examples

The boy is daydreaming of some picture he may have seen or is projecting himself into the future, putting himself into a situation as it would be if he were a man. The boy has seen a movie. The boy is thinking of how he would like to be in the situation as seen. The daydream, if not too vivid or realistic, will be terminated so that he can engage in activity more related to his present needs (No n Ac.)

A boy in a checkered sport shirt holds his head and stares dismally and miserably out through the open window of the school room. A number of reasons can be found to have caused his present unhappiness. For a long time now he has wanted to become a garage mechanic, to get away from the dullness of Cicero and Caesar. But no! They won't let him. He feels miserable and trapped. He can not get out of a mesh of emotional thought and daydreams and worries himself to a nerve-shattering point. Soon he will leap from his chair, go completely berserk and be led away in a large wagon where he will sit on a piece of toast believing himself a fried egg. (This story is scored as having n Ach because of the long-term achievement interest: "he has wanted to become a garage mechanic," but not as having n Ac because obviously it does not meet the criteria of academic interest.)

SUBCATEGORIES

Once the story has been scored for AI, some other subcategories, if clearly present, should be added. Below is a description of these subcategories.

NEED FOR ACADEMIC ACHIEVEMENT (N)

Someone in the story states the explicit desire to reach an academic goal. Expressions such as "he wants to be a doctor," "he wishes to succeed," "he is determined to get a good mark," are the clearest examples. The academic accomplishment desired may be specific, "he wants to learn to be of service to mankind." Need is scored only once per story, even when it appears more than once in varying forms. Need is not inferred from instrumental activity, nor from any of the subcategories. It has to be explicitly stated. Moreover, not all statements of desire that appear in an academic-related story are evidences of the presence of the need. If, for example, a student "wants his classmate to hand him a book," N is not scored. Another kind of statement of need which is not scored is a statement by a very secondary character in the story which defines an achievement goal for the main character. An example of this is "the teacher wants the students to get good marks."

Illustrative Examples

A young person wishes to become a doctor. He can visualize himself performing an operation. He received a toy doctor's kit for a present several years ago, and several of his friends are planning to be doctors. He is thinking of the pleasant and glamorous side of the story and not of the long years of study. He will be unable to pass pre-medical school. He decides to become a laboratory technician because he wants to stay in that field.

Watt and an assistant are working on the development of the steam engine. There has been a need for mechanical power, time, and labor-saving machinery to increase production, a need for better and faster transportation. It looks as though they are fitting a valve or piston. (Need is not scored both because it does not refer to academic achievement and because it is not part of the characters, but rather to a lack in the world.)

INSTRUMENTAL ACTIVITY (I)

Overt and covert activity by one or more characters in the story indicating that something is being done about attaining an academic goal is considered instrumental activity and is scored I. Instrumental activity is scored only once per story, even though there may be several instrumental acts stated. By covert, or mental, activity such as thinking, planning, etc., is meant a kind of internal activity directed to the attainment of an academic goal. Whether or not such instrumental activity is successful, the story is scored I. In another subcategory (the Outcome), attention will be paid to the general successfulness or unsuccessfulness of the story. There must be an actual statement of activity taking place within the story, independent of both the original statement of the situation and the final outcome of the story. Instrumental activity appearing in the initial clause of the first sentence which is sheer description of the picture is not scored, e.g., "here is one student studying." Nor is instrumental activity inferred from the final clause of the last sentence, e.g., "... and he will go on to college." However, a clear-cut statement of an instrumental act appearing either later in the first sentence or earlier in the last sentence may be scored. That is, the first and last sentences should not be disregarded in toto.

A statement of instrumental activity within the story in the past tense may be scored as long as it is more than a statement of the outcome of previous instrumental acts. For example: After the statement of the situation "the student is working on an exam" a statement such as "he has studied diligently, night and day in the past," would be scored I. A phrase such as "he completed an exam yesterday," would not be scored for it is considered as a description of the outcome of previous acts, with no word indicating actual or exceptional striving. A statement of instrumental activity in the future tense may also be scored as long as it is more than a statement of outcome. For example:

"They will succeed" would not be scored I, while "they will continue to work diligently and will succeed" would be scored I.

Illustrative Examples

A boy is dreaming of being a doctor. He can see himself in the future. He is hoping that he can make the grade. It is more or less a phantasy. The boy has seen many pictures of doctors in books, and it has inspired him. He will try his best and hopes to become the best doctor in the country. He can see himself as a very important doctor (Score I).

A teacher and a student are talking. The teacher is telling the student about his past grades, and what the exam will be like. The student's failing grades make him wonder what the exam was going to be like and whether he still had a chance to pass. The student is thinking that he still might pass. The teacher is thinking that he will fail. The student wants to pass, and the teacher undoubtedly wants him to pass also. The student will take the exam and fail. He will take the course over again next semester. (No I in this story. The phrases "thinking that he still might pass" or "will take the exam" are not instrumental activity showing clearly concern or direction towards an academic achievement).

It should be added that if the character in the story engaged in academic oriented activity asks for help or consults other students or puts questions to the teacher in order to better succeed in his goal, the stories should be scored as having I. This scoring must always be considered from the point of view of the character or characters in the story who are striving for academic achievement. As stated above, even if the instrumental acts are unsuccessful, they should be scored. On the whole, it must be added that instrumental activity can be one of the best characteristics to detect academic motivation since n Ac may be defined as "academic concern which leads to some action." Activity is perhaps a necessary prerequisite of motivation. (See Anticipatory Goal States for a distinction between covert activity and anticipations).

AFFECTIVE STATES (A+ AND A-)

Affective (emotional) states associated with academic successes, academic achievements, or frustration of the academic-directed activity are scored A. When someone in the story experiences: 1) a positive affective state associated with an academic accomplishment (he enjoys studying), (he is very satisfied with his grades), or 2) definite objective benefits as a result of successful achievements which allow the inference of positive affect (he obtained many scholastic awards, fame and fortune were his, he received an excellent grade), A+ is scored. As can be seen, A+ indicates more than mere successful instrumental activity. In the objective benefits there should be adequate indications of the association with academic success from which positive affect might be inferred with little doubt, i.e., "he becomes a famous surgeon." The mere fact that the character becomes a doctor is not enough, he should be a famous doctor or a very successful one. Positive affect may occur within the story or it may be associated with the outcome of the story. It is scored only once per story and should be scored when there is a definite statement of positive affect associated with the academically directed activity, or a statement of objective benefits as a result of academic endeavors above and beyond the statement of instrumental activity. A+ can come in the middle of the story when positive affect regarding progress toward the goal is evinced. For example: "He is interested in his work."

When someone in the story experiences: 1) a negative affective state associated with failure to attain an academic goal (he is disturbed over his inability, finds himself over his depth) or 2) the objective concomitants of complete failure and deprivation which allow the inference of negative affect (he did not study and became a drunken bum, he was expelled from the college), A- is scored. As in the case of positive affect, negative affect must not be inferred merely from the unsuccessful outcome of instrumental activity. Negative affect may occur within the story or at its very end, but it is scored only once per story. Both positive and negative affect may appear in the same story, in which case both are scored. Mere mention of famous persons is not sufficient evidence for scoring this subcategory. Let us repeat that the affective state categories are only scored when associated with the academic-related activities of the story, as is the case with all subcategories.

Illustrative Examples

A father is talking to his son. He is telling him that he is proud of him because he is doing so well in school. He wants his son to stay on the ball and keep getting good marks. He just knows his son will be a very successful business man. The son has just come home from college after pulling honors all through the year. He never goes out and is always in his room studying. He never partakes in sports. They are both dreaming of what the son will be in the future, a successful business man (Score A+).

This is the night before the big economics exam, and Johnny Jones is worried. He has got to get an A. He has been taking it easy all year and now wants to bring his average up with a good grade. He is thinking of what a damn fool he has been, and why didn't he study the month before. He must get an A or he will have to take the course over. If he has to take the course over, he knows his father will give him the devil for not working hard the first part of the year (Score A-).

ANTICIPATORY GOAL STATES (G+, G-)

This subcategory is scored when someone in the story anticipates goal attainment or goal frustration and failure. It is scored positive (G+) when someone in the story is thinking about the success he will achieve, expects he will pass the exam, dreams of himself as becoming a great surgeon. The Anticipatory Goal State is scored negative (G-) when someone is worried about failure, is concerned over the possibility he will not pass the exam, expects the worst, or is wondering whether or not he will succeed. Both G+ and G- may be scored in the same story, but each may be scored only once. The G- category includes all academic related anticipations that are not clearly positive. A distinction should be made between instrumental thought (I) and goal anticipation

(G+). When a person is thinking or planning or wondering *how* to attain the goal, score I. When he is dreaming or pondering *about* the results or the completion of his task, ~~the results of it,~~ then score G+, or G-. Academic-related anticipations must refer to the achievement goal of the story. Recollecting a past goal state or goal activity is also scored G+ since we have no past oriented category for thought processes.

Illustrative Examples

This young boy is dreaming of the day he will have completed his training and become a great and famous instructor. Perhaps this portrays someone already famous for research. He has been asked by his father or relative what he wants to do when he grows up, and he is trying to tell them the mental picture he has in mind of himself in thirty years. The boy is thinking of *the great thrill* that must be experienced by a doctor when he performs a delicate operation, saving someone's life. The boy will go to college and eventually become a world-famous doctor (Score G+).

The student, Peter, is flunking a physics exam which is very important to get into dental school. He fooled around at the beginning of the semester and got two E's on tests and has since studied rather... he is *frightfully afraid* as he wants an A to balance the E's. His mind is thus confused as he cannot understand the problems. *He feels that he will fail*. By a stroke of luck, the class average is very low and Peter gets a B. He is thus encouraged and fights bravely on to get a B at the end of the semester. (This story is scored AI due to the long-term involvement regarding getting into dental school. Also the boy is encouraged when he gets a B and then fights bravely for a B on the final. The story has also *need* because he wants an A. It has A+ "thus encouraged" and G- which has been underlined.)

OBSTACLES OR BLOCKS (Bp, Bw)

Stories are scored for obstacles when the progress of goal directed activity is blocked or hindered in some way. Things do not run smoothly. There are obstacles to be overcome before the academic related goal may be obtained. The obstacles may be a previous deprivation as for instance a previous failure or an obstacle that may be present, either personally or environmentally. If the obstacle is located *within the individual* (lack of confidence, a conflict to be overcome, inability to make decisions, some past failure or mistake) it is scored

Personal Obstacle (Bp) "or block within the person." When the block to be overcome is part of the environment, that is, when it may be located in the world at large, or when there is some doubt about whether it is located in the individual or in the world, environmental obstacle (Bw) is scored, or "block in the world." Both Bp and Bw may occur and be scored in the same story, but each is scored only once per story.

It is necessary to make a distinction between "apparent obstacles," which really define the achievement goal of the story, and real obstacles to on-going academic directed behavior. If a story began with the statement "the student had great difficulty in entering college," B is not scored, since the obstacle has already occurred, been overcome and defines the achievement goal of the story. However, if the student already in college has been notified that he will be dismissed unless he improves, then Bw is scored. In this latter case the obstacle interrupts or jeopardizes goal-directed activity in progress. This distinction is made only in the case of Bw. In the cases of past failures, they are scored Bp whether or not they interfere with the immediate goal directed activity.

Illustrative Examples

A boy is day-dreaming. He is a student who knows he has to study. In the past he has had poor marks. Now he realizes he must study harder or else his poor work will just be a waste of time. He thinks of the last mark and what will happen if he does not improve. This man will really study and prove to himself that he is not a failure, but will make good (Score Bp).

A student is sitting at his desk, worrying over his grades. He has had poor high school preparation for college, and as a result, poor semester grades. He wishes he could settle down and make a go of his college without constant failure. He eventually makes a go of his college after finding courses in which he is interested. (In this last example the obstacle is scored Bw and not Bp as in the first example, because it seems that the high school, and not the student is to blame for his inadequate preparation.)

ACADEMIC ACHIEVEMENT THEMA (Th)

Academic Thema (Th) is scored when the achievement imagery is elaborated in such a manner that it becomes the exclusive or major *central plot* or thema of the story. Striving for an academic goal and eventual attainment of the goal may be either the only or the central plot of the story. If there is a major counter-plot, or if there is any doubt about the academic imagery being central to the plot, or if besides academic motivation there is also *clearly* another type of motivation, then Th is not scored.

Illustrative Examples

A man motivated by his desire to achieve the top in his profession to satisfy his own ambition as well as to give all things to his beloved family. I think he enjoys this for himself as well as for the family motives. He has always been ambitious and prepared himself well. His appearance to me indicates a certain self-satisfaction. He has succeeded in all his goals, he very likely had a self-imposed schedule he would like to think he achieved. He is thinking of his achievements as he looks up from his work to the picture. He feels pleased with himself, his work and family. He will continue but one day may not be as happy -- a little bored, perhaps -- when he has no new world to conquer for himself or his family. Then he will need more goals to reach for in order to feel fulfilled. (The central plot is professional achievement but Th is not scored because there is also the family motive).

A young boy is day-dreaming about the past wars in which doctors have participated. He is not sure of the course to follow. He can not decide whether or not to become a doctor. He is thinking about John Drake, the great surgeon of World War I and his great feats in it. He was certainly a remarkable man. The boy will finally become a famous surgeon himself and in turn will be an incentive to the future doctors of the world to work hard and be interested only in the welfare of mankind. (By way of contrast this story illustrates the subcategory Th because no other interest is introduced.)

OUTCOME (O)

The *outcome* of the stories, an integral and very important part, is not scored when computing need for achievement, need for power or need for affiliation. We feel that this is a probable shortcoming in the method developed by McClelland and his associates. When measuring academic motivation positive outcomes will be scored as another subcategory. As for negative outcomes, they will not be scored, the reason being that a negative outcome might mean, in most instances, that the person is not motivated to achieve, or is motivated doubtfully. It is felt that a negative outcome in the story sometimes may be interpreted as meaning: to try and to desire to achieve does not pay off. On the other hand, when one of the characters of the stories strives towards goal achievement, overcomes obstacles and succeeds, it seems that the person, besides being positively motivated, is also saying that the desire to achieve pays off. It is for this reason that stories with a positive outcome will be scored and the outcome considered as another subcategory. Doubtful outcomes will be considered as negative outcomes for the purpose of scoring and they are not scored either.

Illustrative Example

An engineer is taking an open book exam and he finds the exam too difficult. The student is not stupid, but he has a girl and didn't study as hard as he should have. He wishes that he had studied harder and wishes the correct answers. He would cheat, but it is an oral exam and he has too much character. He will get a D in the exam and will turn over a new leaf and devote the proper time to study. (It might seem that the outcome here is negative -- he gets a D. However, the story should be scored as having a positive outcome due to the final sentence "will devote the proper time to study."

SCORING OR COMPUTING N AC

To compute the need for academic achievement score give +2 for academic achievement imagery (AI), +1 for doubtful imagery (DI) and zero for unrelated imagery (UI). Subcategories, as stated, can be scored only if AI has been scored. Each subcategory scored counts +1. Since each category may be scored only once, the maximal score possible for a single story would be +12 (AI, N, I, A+, A-, G+, G-, Bp, Bw, Th, and 0). The total academic achievement scored by a particular person is the sum of the scores obtained by all of the stories written by that person. The scores of different persons are comparable when the scores are obtained from the same number of stories written about the same pictures.

APPENDIX THREE

FRESHMAN SURVEY

This school has been chosen to participate in a survey of college students. What follows is not a test, but a series of questions, resembling an interview, mostly about your background. Obviously, there are no right or wrong, good or bad answers. All you are expected to do is to give your honest answer, to the best of your ability, on a number of things.

Honesty is all-important. Be as candid and complete as you can. We need your name on the paper for identification, but all information will be kept confidential and has nothing to do with your academic work or your standing in the college.

Write your answers in the indicated space or in the space which immediately follows each question. In case you need more space you may write between lines or use the reverse side of each page.

Thank you for your cooperation.

Name.............................. Age...... Birth Date.............

School............................. Major.......... Single... Married...

I GENERAL BACKGROUND

1. Are your father and mother still living?

   a. What is (or was, if deceased) your father's occupation? (Be specific)

   b. What is (or was, if deceased) your mother's occupation?

   c. What was the highest grade of school your father completed? (Circle the appropriate number). Less, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, More. Master's. Doctorate.

   d. What was the highest grade of school your mother completed? (Circle the appropriate number). Less, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, More. Master's. Doctorate.

   e. How many brothers do you have?.(Write the age of each).

   f. How many sisters do you have? (Write the age of each).

   g. Have you been separated from either of your parents at any time? If yes, explain.

   h. For how long?

   i. Have your parents been separated or divorced? If yes, since when?

   j. With whom have you been living for most of your life?

   k. As well as you can remember, during what periods of your life did you live with your father?

2. In what part of the United States or in what country did you spend the major part of your childhood (until age 12)........................... and adolescence........................

3. What type of high school did you attend? (For how long?)
   Public............. Private............ Both.............

4. While attending college will you live on campus, with your parents, or off campus?

5. List any foreign lagguages spoken frequently at home.

6. Approximately what is the combined annual income of your parents?
a. Less than $8,000........ b. Between $8,000 and $12,000........
c. Between $12,000 and $20,000..... d. Above $20,000......

7. Has there been any significant change in your opinion of your father since age 10?

8. Which of your father's (or guardian's) traits or qualities would you like most to have?

9. Which of your father's (or guardian's) traits or qualities would you like least to have?

10. In what ways are you most like him?

11. Has there been any significant change in your opinion of your mother since age 10?

12. Which of your mother's (or guardian's) traits or qualities would you like most to have

13. Which of your mother's (or guardian's) traits or qualities would you like least to have?

14. In what ways are you most like her?

15. To which parent (or guardian) did you feel closer at the ages listed below: (answer for each age group)
3 - 6...................... 7 - 11 ....
12 - 17 .... At present..................

16. Which parent (or guardian) usually did the disciplining in your family?

17. How has your home life with your parents (or guardians) been most of the time?
Unhappy......... Bearable........ Pleasant........ Very happy.........

II EDUCATIONAL BACKGROUND

1. What was your academic record in high school?
Excellent (A)... Good (B)... Average (C)... Poor ...

2. What were your better subjects?

3. What were your poorer subjects?

4. List your last semester courses and grades:

Course	Grade	Course	Grade
....	.....	....	.....
....	.....	....	.....
....	.....	....	.....

5. What was your academic rank in your high school graduating class?
(Your numerical standing - for example - 1st, 18th, 95th, etc.)

6. How many were in your graduating class?

7. What was your quality point average during high school?

8. List any fellowships, honors, scholarships ....
....
....

9. Have you ever failed to present school assignments on time?
a. Sometimes..... b. Often..... c. Never.....

10. Which courses have you failed in high school?

11. List the extra-curricular high school activities you participated most in.
....
....
....

12. On an average, how many hours did you give to extra-curricular activities last year? ....

13. Comparing yourself with others of the same age and sex, was tho time you spent on extra-curricular activities,
a. Above average..... b. Average..... c. Below average.....?

14. Do you intend to spend a similar number of hours on these activities this year?

15. In what type of activities, work, etc. (music, sports, mechanical work, mathematics) do you feel you perform very well?........................

16. In what type of activities, work, etc. (music, sports, mechanical work, mathematics) do you feel you do NOT perform very well?................

17 In an average week during your last year of high school, how much time did you spend in each of the following activities? Indicate time when you were attending school - NOT vacation time. Take a typical seven day period.

EXAMPLE: If you spent about 8 hours each night sleeping, you should indicate 7 x 8, that is, 56 hours.

No. of Hrs.

Studying or preparing school assignments (_______)

Attending classes (_______)

Unassigned reading (_______)

Talking informally with others (_______)

Radio, phono, watching TV (_______)

Attending movies and plays (_______)

Attending sports events (_______)

Daydreaming (_______)

No. of Hrs.

Commuting to and from school (_______)

Working for a salary (_______)

Working in your own private business enterprise (_______)

Participating in sports and practice sessions (_______)

Participating in other extra-curricular activities (_______)

Fooling around, wasting time (_______)

Sleeping (_______)

III EDUCATIONAL AND VOCATIONAL PLANS

1. What profession or career do you think you might enter?

2. Who tried to help you most in an attempt to make your vocational plans?
a. Father.... b. Mother.... c. Other family members....

3. With what other persons have you consulted about your future occupation or profession?

4. Why did you make this choice? Write 1, 2, and 3 to indicate your reasons in order of importance.

... Family suggestion or tradition
... Friend's or teacher's advice
... Vocation of someone I admire
... Suggested by study in school
... Work I did related to it
... Long personal interest
... Most profitable financially
... Best suited to my abilities
... Most challenging
... Other (explain)

5. List, in order of preference, 3 professions or careers, other than the one selected, in which you think you would like to earn your living.

Occupation	Reason for interest
a.	....
b.	....
c.	....

6. How much reading have you done about the profession or career you have selected? a. More than 5 books... b. Less than 5 books...
c. Number of pamphlets... d. None...

7. With how many experts in that field have you discussed your choice?

8. What magazines related to your vocational choice do you read regularly?

9. What part-time jobs related to your vocation have you had? (List them)

10. How certain are you that this vocation is the one you really wish to prepare for? a. Very certain... b. Certain... c. Doubtful... d. Very doubtful...

11. If you could do as you wish, what would you wish to be doing 10 years from now?

12. What do you intend to major in?.................. Why?..................

13. List, in order of preference, other majors you have seriously considered.

IV HEALTH BACKGROUND

1. Do you have any trouble sleeping at night?
a. Often..... b. Sometimes..... c. Never.....

2. Do you have spells of dizziness?
a. Often..... b. Sometimes..... c. Never.....

3. Are you bothered by stomach upsets?
a. Often..... b. Sometimes..... c. Never.....

4. Are you troubled by severe headaches?
a. Often..... b. Sometimes..... c. Never.....

5. Do you worry in such a way that it prevents you from studying efficiently?
a. Often..... b. Sometimes..... c. Never.....

6. Are you bothered by major ailments in different parts of your body?
Specify...
a. Often..... b. Sometimes..... c. Never.....

7. How frequently do you feel in good spirits?
a. Often..... b. Sometimes..... c. Never.....

8. Do personal problems prevent you from concentrating?
a. Often..... b. Sometimes..... c. Never.....

9. Do you feel healthy enough to do the things that you would like to do?
a. Often..... b. Sometimes..... c. Never.....

10. Do you remember things well?
a. Often..... b. Sometimes..... c. Never.....

11. Do you have any trouble in making decisions?
a. Often..... b. Sometimes..... c. Never.....

12. Do you feel sure of yourself?
a. Often..... b. Sometimes..... c. Never.....

13. As compared with others of your own sex and age, how psychologically healthy do you feel?
a. More healthy than others.... b. Equally healthy....
c. Less healthy....

14. Do you tend to procrastinate too much in doing things?
a. Often..... b. Sometimes..... c. Never.....

15. How frequently has ill health affected the amount of work you do?
a. Often..... b. Sometimes..... c. Never.....
Explain...

16. Have you consulted a doctor or psychologist in the past year?
If so, for what reason?

17. Do you have any other serious problems we have not covered?
If so, please explain.

18. How much do you smoke? (Circle all that apply)
a. I do not smoke..............................1
b. I smoke from 1 - 19 cigarettes a day...... 2
c. I smoke from 20 - 39 cigarettes a day..... 3
d. I smoke 40 or more cigarettes a day....... 4

e. I smoke 1 - 3 cigars a day 5
f. I smoke more than 3 cigars a day.......... 6

g. I smoke 1 - 3 pipefuls of tobacco a day... 7
h. I smoke more than 3 pipefuls of tobacco a day............................. 8

V INTERESTS AND ATTITUDES

Below are some statements reflecting attitudes towards various matters. Indicate the amount of your agreement or disagreement.

		Strongly agree	Slightly agree	Slightly disagree	Strongly disagree
1.	I prefer to risk a little to make a lot. In that way, if I am right one time in five, I am doing all right.	1	2	3	4
2.	The amount of education a person has should be a factor in determining his pay scale.	1	2	3	4
3.	There is hardly any such thing as good luck. People must make their own opportunities.	1	2	3	4
4.	I approve of married women having a career or job outside the home.	1	2	3	4
5.	Planning only makes a person unhappy because one's plans hardly ever work out anyway.	1	2	3	4
6.	I work like a slave at everything I undertake until I am satisfied with the results.	1	2	3	4
7.	I set difficult goals for myself which I attempt to reach and achieve.	1	2	3	4
8.	It would irritate me very much to have a watch or clock which is slow by several minutes every day or so.	1	2	3	4
9.	When a man is born, the success he is going to have is already in the cards, so he might as well accept it and not try to change it.	1	2	3	4
10.	I often do something just to prove to myself that I can do it.	1	2	3	4
11.	I enjoy work as much as play.	1	2	3	4
12.	You can get ahead only by hard work.	1	2	3	4
13.	I feel that nothing else which life can offer is a substitute for great achievement.	1	2	3	4
14.	I usually work harder than I have to.	1	2	3	4
15.	I prefer a secure job with a fairly good salary to a job with less salary but in which I can move up higher	1	2	3	4
16.	If people had not had it in for me, I would have been much more successful.	1	2	3	4

17. How many hours, on the average, do you spend studying during an ordinary week?
    a. Less than 4 a week...... b. Between 5 and 8 a week......
    c. Between 9 & 15 a week.... d. More than 16 a week.........

18. How many more hours per week do you think you should spend studying in order to achieve your academic goals?
    a. No more hours b. A few more hours
    c. More than 5 hours d. More than 8 hours

19. Underline 10 of the following words which most closely fit you most of the time:

    Dependent, dominant, detached, relaxed, assertive, tense, calm, confident, anxious, kind, aggressive, considerate, amiable, talkative, reserved, warm, active, cool, affected, reckless, suspicious, tolerant, energetic, inhibited, forgiving, outgoing, precise, generous, enterprising, restrained.

VI RELIGIOUS BACKGROUND

1. What is your present religious preference? (Circle one)
   a. Protestant (circle and specify)
   b. Catholic
   c. Jewish
   d. Other (Circle and specify)
   e. None

2. What is (or was) your father's (or guardian's) preference?

3. To what extent does he participate in organized worship?
   a. Not at all
   b. Fewer times than once a month
   c. Once or twice a month
   d. Weekly
   e. Oftener than Sundays (The Sabbath) and Holydays
   f. Regularly for his Church

4. What is (or was) your mother's (or guardian's) religious preference?

5. To what extent does she participate in organized worship?
   - a. Not at all
   - b. Fewer times than once a month
   - c. Once or twice a month
   - d. Weekly
   - e. Oftener than Sundays (Tho Sabbath) and Holydays
   - f. Regularly for her Church

6. To what extent do you participate in organized worship?
   - a. Not at all
   - b. Fewer times than once a month
   - c. Once or twice a month
   - d. Weekly
   - e. Oftener than Sundays (The Sabbath) and Holydays
   - f. Regularly for your Church

7. What is your attitude towards religion?
   - a. All my life revolves around religious ideals and obligations
   - b. Only moderately concerned with religion
   - c. Slightly concerned with religion
   - d. Not concerned with religion at all

8. Have your religious beliefs only (and not your parents, friends, or fear of the law) stopped you from doing something wrong?

   a. Never... b. Rarely... c. Sometimes... d. Often... e. Very Often...

9. How often have you received Holy Communion during the past two years? Circle one.
   - a. It is not a practice in my Church
   - b. Never
   - c. Less than once a year
   - d. Once a year
   - e. Several times a year
   - f. Once or twice a month
   - g. Every week
   - h. More often than every week